SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM

CONTRIBUTIONS

FROM THE

UNITED STATES NATIONAL HERBARIUM

VOLUME 17, PART 5

STUDIES OF TROPICAL AMERICAN PHANEROGAMS—No. 1

By PAUL C. STANDLEY

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BULLETIN OF THE UNITED STATES NATIONAL MUSEUM.

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PREFACE.

The collections obtained during the recent biological survey of the Canal Zone and adjacent parts of Panama furnish to the United States National Herbarium means of greatly extending the knowledge of the botany of that region. In working over portions of this material Mr. Standley finds it desirable in many instances to include in his study specimens from other parts of tropical America. Since these studies are likely to extend over several years it has seemed advisable to publish the results in serial form. The present paper, with its revisions of genera, descriptions of miscellaneous new species, and corrections in nomenclature, is typical of the proposed series.

FREDERICK V. COVILLE,
Curator of the United States National Herbarium.

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STUDIES OF TROPICAL AMERICAN PHANEROGAMS—NO. 1.

By PAUL C. STANDLEY.

INTRODUCTION.

The present paper introduces a series which is intended to include notes upon plants of tropical and subtropical North and South America and descriptions of miscellaneous new species, as also taxonomic reviews of some of the smaller genera. The plants discussed in the first installment are some which were studied by the writer while preparing a report upon certain families for a proposed flora of Panama. They belong to the Cyperaceae, Gentianaceae, Rubiaceae, and the families formerly associated as the Leguminosae. The determination of the Panaman species of Sommera, Watsonamra, and Cobaea has necessitated a revision of these genera, the results of which are here published. Most of the new species are from the large collections made by Mr. H. Pittier in Colombia and in Central America, especially in Costa Rica.

Unless otherwise indicated, all specimens cited are in the United States National Herbarium.

TWO NEW SPECIES OF DICHROMENA.

Dichromena is one of the smaller genera of the Cyperaceae, but several of its species have a wide distribution in tropical America. The two species described here are apparently of limited distribution.

Dichromena pittieri Standley, sp. nov.

Perennial from a cluster of fibrous roots; leaves very numerous, flat, 8 to 15 cm. long, 2 to 4 mm. wide, attenuate, not dilated at the base, pale grayish green, densely velvety-pubescent on both surfaces with short, very fine hairs; culms numerous, obtusely angled, slender, slightly surpassing the leaves, 16 to 21 cm. high, densely pubescent; bracts of the inflorescence about 6, 2 to 10 cm. long, often with a few very short additional ones, about as wide as the leaves, slightly discolored at the base and ciliate, elsewhere finely and densely pubescent; spikelets numerous, 8 to 12, 4.5 to 5 mm. long, densely capitate, the whole head about 1 cm. in diameter; scales white, glabrous, oblong, ovate, or lanceolate, acute, thick and firm, prominently keeled but without other evident nerves; style linear, the branches much elongated; achene about 1 mm. long, broadly obovoid, brownish white, shining, very finely and rather obscurely transversely undulate; beak broadly pyramidal, about one-fourth as long as the achene.

Type in the U. S. National Herbarium, no. 691286, collected between Quebrada del Bollo and El Platanal, on the trail from Río Frío to San Andrés de la Sierra, State of Magdalena, Colombia, altitude about 1,000 meters, July, 1906, by H. Pittier (no. 1692).

A very distinct species, related to *D. ciliata*, but distinguished by its abundant pubescence, pale leaves, densely capitate inflorescence of numerous small spikelets, and pale achenes.

Dichromena ebracteata Standley, sp. nov.

Perennial from a slender dark brown creeping rhizome; leaves numerous, thin, flat, bright green on the upper surface or sometimes glaucous, glaucous beneath, 8 to 16 cm. long, about 2.5 to 5 mm. wide, dilated at the base and ciliate, elsewhere finely pubescent with spreading or somewhat appressed hairs or glabrate; culms very slender, 6 to 20 cm. high, usually shorter than the longer leaves but sometimes longer, finely villous or glabrous; bracts represented by 1 or 2 subulate-lanceolate green membraceous-margined scales 2 mm. long or less; spikelets 3 to 8, subspicate, sessile or one of them short-pedunculate, 5 to 10 mm. long; scales of the spikelets nearly white, thin, glabrous, oblong, obtuse, often emarginate, keeled; style linear, with elongated branches; achenes broadly obovoid, 1 mm. long, yellowish green, finely rugulose with faint transverse undulate lines, the beak one-third as long, white, thin.

Type in the U. S. National Herbarium, no. 692624, collected in Lot 42, Island of Tobago, along banks, April 21, 1913, by W. E. Broadway (no. 4455).

ADDITIONAL SPECIMENS EXAMINED:

TOBAGO: Forest Reserve, above Caledonia, *Broadway* 3071.

VENEZUELA: El Valle, Island of Margarita, *Miller & Johnston* 190.

Dichromena ebracteata is as closely related to *D. ciliata* Vahl as to any species, but from this and all others heretofore described it may be distinguished by the abortive involucral bracts, these being much shorter than the spikelets. The Venezuelan specimen was distributed as *Dichromena leucocephala* Michx. (*D. colorata* (L.) Hitchc,), a species with which it has little in common.

THE GENUS BISBOECKELERA.

In 1842 Nees von Esenbeck described in Martius's Flora Brasiliensis[1] a new genus of Cyperaceae, which he called Hoppia in honor of the German botanist Hoppe. Unfortunately, there was already a genus Hoppea of the Gentianaceae, dedicated by Willdenow in 1801[2] to a man of the same name. This was used in the form Hoppea by Sprengel in 1818.[3] Taking the proper view that Nees's name should be replaced, Otto Kuntze in 1891[4] suggested Bisboeckelera as a substitute, and this name, although ill-formed, is the one that must be used.

The genus consists of but few species, all from the western and northern parts of tropical South America. It was considered by Nees a member of the tribe Cariceae, while Bentham and Hooker[5] placed it in the Cryptangieae. Pax, in his treatment of the family in Engler and Prantl's Natürlichen Pflanzenfamilien,[6] associated

[1] 2¹: 199. *pl. 30.*
[2] Ges. Naturf. Freund. Berlin Mag. 3: 434.
[3] Anleit. Gewächs. 2²: 889.
[4] Rev. Gen. Pl. 2: 747.
[5] Gen. Pl. 3: 1042. 1883.
[6] 2²: 119. 1887.

BISBOECKELERA VINACEA STANDLEY.

this and five other related genera of South American plants as a new tribe, the Hoppieae. On account of the lapse of the generic name Hoppea in the Cyperaceae, this was replaced by the same author with the tribal name Bisboeckelerieae [1]

The species, so far as known, are enumerated below. Two of them, *B. bicolor* and *B. vinacea*, are closely related to the type of the genus (*Hoppia irrigua* Nees), but the others diverge considerably in general appearance and may not be congeneric.

Bisboeckelera angustifolia (Boeckel.) Kuntze, Rev. Gen. Pl. **2**: 747. 1891.
Hoppia angustifolia Boeckel. Flora **54**: 37. 1871.
TYPE LOCALITY: French Guiana.

Bisboeckelera berroi (Clarke) Standley.
Hoppia berroi Clarke, Kew Bull. Misc. Inf. add. ser. **8**: 62. 1908.
The type is from Paso de los Toros, Uruguay, collected by Berro (no. 2169).

Bisboeckelera bicolor (Clarke) Standley.
Hoppia bicolor Clarke, Kew Bull. Misc. Inf. add. ser. **8**: 62. 1908.
Collected by Riedel in Brazil, Minas Geraes, Una, near Ouro Preto. It is described as having the upper surface of the leaves of a copper-brown color and the lower surface glaucous.

Bisboeckelera irrigua (Nees) Kuntze, Rev. Gen. Pl. **2**: 747. 1891.
Hoppia irrigua Nees in Mart. Fl. Bras. **2**[1]: 199. *pl. 30*. 1842.
The type was collected "In lapidosis udis silvarum ad flumen Japurá prope Manacarú et ad portum prov. fluminis Nigri."

Bisboeckelera longifolia (Rudge) Standley.
Schoenus longifolius Rudge, Pl. Guian. 14. *pl. 16*. 1805.
Hoppia microcephala Boeckel. Flora **54**: 37. 1871.
Bisboeckelera microcephala Kuntze, Rev. Gen. Pl. **2**: 747. 1891.
The type of this species was collected somewhere in the Guianas by an unknown collector. The type of *Hoppia microcephala* is from Surinam.

Bisboeckelera vinacea Standley, sp. nov. PLATE 24.
Perennial with many coarse purplish fibrous roots and numerous horizontal rhizomes covered with overlapping purplish leaflike bracts; leaves all radical, 38 cm. long or less, the outermost shortest, about 2 cm. wide, acute, glaucous on the upper surface and glabrous or with a few scattered hairs, scabrous and glandular on the midvein, beneath of a deep purplish red, strongly nerved, glandular-puberulent, narrowed below but expanded into a broad and sheathing base, scaberulous on the margins, these inrolled in drying; culm naked, about 25 cm. long, triangular, brown, scaberulous on the angles; bracts of the inflorescence 2, similar to the leaves, the longer 50 mm. long, the other about 15 mm.; inflorescence of about 7 dense oblong sessile spikes 15 to 20 mm. long; glumes at the base of each spikelet 2, oblong-lanceolate, acute, purplish, puberulent; spikelets consisting each of 1 fertile and 2 sterile florets; mature perigynium 5 to 6 mm. long, ovoid, tapering into a long subulate beak, purplish red, faintly nerved, puberulent; achene 2 mm. long and of the same diameter, obtusely angled, dark brown, shining, smooth, contracted at the base into a short stipe, bearing on the apex a short beak about one-fourth the length of the body.

[1] In Engl. & Prantl, Pflanzenfam. Nachtr. 47. 1897.

Type in the U. S. National Herbarium, no. 530770, collected near Córdoba, in the Dagua Valley, Pacific Coastal Zone, State of Cauca, Colombia, altitude 30 to 100 meters, December, 1905, by H. Pittier (no. 583).

Closely related to the type of the genus, *B. irrigua*, but differing in the form of the fruit, which is not ridged on the angles and depressed on the sides, in the short involucral bracts, and in the more ample, differently arranged inflorescence. Nees does not speak of a purplish coloration of the lower surface of the leaves of his plant, although he does state that the petioles are reddish. Probably the coloration of the leaf surfaces is distinctive in this Colombian species.

EXPLANATION OF PLATE 24.—Type specimen. Two-fifths natural size.

NEW LEGUMINOUS PLANTS OF SEVERAL GENERA.

The two species of Phaseolus of the section Leptospron described below have been confused with *P. speciosus* H. B. K. That plant was described from specimens collected along the Orinoco River, and it is doubtful whether it occurs in Central America. It differs from both the Guatemalan species in having the lower calyx lobes only slightly longer than the upper, as well as in other minor characters.

The remaining species are of the genera Chamaecrista, Calliandra, Mimosa, Erythrina, and Dolicholus. All are from Guatemala and Costa Rica, except a new species of Dolicholus collected by Mr. Pittier in Colombia.

Phaseolus spectabilis Standley, sp. nov. PLATE 25.

Stems twining, slender, densely pilose with rather short hairs; stipules oblong-ovate, 3 to 4 mm. long, persistent, obtuse or acute, finely parallel-nerved, pilose, not produced at the base; petioles 2 to 9 cm. long, pilose; stipellæ oblong to rounded-ovate, obtuse, 2 mm. long; petiolules 3 mm. long or less; leaflets ovate to oblong or rhombic-lanceolate, 5 to 11 cm. long, 2 to 6 cm. wide, the lateral ones asymmetrical, the terminal one larger than the others, all rounded at the base, acute or abruptly short-acuminate, thick and firm, lustrous on the upper surface and scaberulous, beneath sericeous but not densely so, prominently veined; racemes 8 to 17 cm. long, nodose, pilose; bracts deciduous, ovate, acute to abruptly acuminate, 5 to 7 mm. long; pedicels 4 mm. long or less; calyx 15 to 20 mm. long, pilose, the tube broadly campanulate, 5 mm. long, the upper lip very broad, shallowly emarginate, the lower lip 3-lobed, the lobes twice as long as the tube or more, lanceolate or ovate, overlapping at the base, 6 mm. wide or less, attenuate to the apex; banner 3 cm. long, broadly obcordate, sessile, glabrous; wing petals and keel of about the same length, the latter several times spirally coiled; style strongly bearded; legumes about 14 cm. long and 8 mm. broad, straight, the valves glabrous, with thickened carinate margins.

Type in the U. S. National Herbarium, no. 472942, collected in the vicinity of Secanquím, Department of Alta Verapaz, Guatemala, altitude 550 meters, May 7, 1905, by H. Pittier (no. 281).

ADDITIONAL SPECIMENS EXAMINED

GUATEMALA: Near the Finca Sepacuité, Alta Verapaz, *Cook* 15. Vicinity of Secanquím, Alta Verapaz, alt. 550 meters, *Maxon & Hay* 3145, 3146. Cubilquitz, Alta Verapaz, alt. 350 meters, *von Türckheim* (J. D. Smith, no. 7856).

EXPLANATION OF PLATE 25.—Leaf, fruit, and flowers of *Phaseolus spectabilis*, from the Finca Sepacuité, Alta Verapaz, Guatemala. Photographed by O. F. Cook. Natural size.

PHASEOLUS SPECTABILIS STANDLEY.

Phaseolus stenolobus Standley, sp. nov.

Stems slender, twining, pilose with reddish brown hairs; stipules persistent, not produced at the base, lanceolate, acute, 3 to 4 mm. long, conspicuously parallel-nerved, pilose; petioles slender, 4 to 8 cm. long, pilose; stipellæ minute; petiolules 3 mm. long or less; leaflets thin, rhombic-ovate to triangular-oblong, 6 to 11 cm. long, 3.5 to 7 cm. wide, acuminate, rounded or obtuse at the base, abundantly pubescent on the upper surface with long, very slender, appressed hairs having bulbous bases, softly pubescent beneath with similar hairs; peduncles 16 to 22 cm. long, pilose, the racemes short, few-flowered, nodose; bracts lance-linear or lanceolate, 9 to 12 mm. long, deciduous; pedicels 4 mm. long or less; calyx about 12 mm. long, sparsely pilose, the tube broadly campanulate, 3 mm. long, the upper lobe very short, shallowly emarginate, the 3 lower lobes linear, acute, 2 or 3 times as long as the tube; corolla segments about 3 cm. long, glabrous, subequal, the keel several times spirally coiled; style abundantly bearded above; fruit not seen.

Type in the U. S. National Herbarium, no. 355066, collected at Cerro Redondo, Department of Santa Rosa, Guatemala, altitude 1,500 meters, October, 1893, by Heyde and Lux (J. D. Smith, no. 6135).

Differing from the preceding species in the narrow calyx lobes, narrow bracts, and the different pubescence of the leaflets.

Chamaecrista macropoda Standley, sp. nov.

Stems probably prostrate, stout, abundantly setose and cinereous, copiously leafy; stipules lanceolate or ovate-lanceolate, about 12 mm. long, rather abruptly attenuate, aristate-tipped, obliquely rounded at the base, appressed to the stems, strongly nerved, setose on the margins; leaf rachis 2 to 3 cm. long, subulate-appendaged above the uppermost pair of leaflets, the lowest pair of leaflets borne near the base; petiolar gland very small, short-stipitate; leaflets 3 to 5 pairs, rather firm, narrowly oblong, 10 to 20 mm. long, 3.5 to 5 mm. wide, obtuse, aristate-tipped, obliquely rounded at the base, glabrous or sparingly ciliate, conspicuously pinnate-veined, the midvein excentric; flowers solitary or 2 in each axil; pedicels 20 to 37 mm. long, ascending, slender, glabrous, bearing a pair of small linear-subulate bracts near the apex; sepals 6 to 7 mm. long, thin, oblong-lanceolate, acute, subulate-tipped, glabrous or sparingly setose; petals about 8 mm. long; legumes 35 to 45 mm. long, 4.5 mm. wide, abruptly acutish, the beak about 1 mm. long, minutely appressed-pubescent, 10 to 12-seeded.

Type in the U. S. National Herbarium, no. 258959, collected on the Cerro Redondo, Department of Santa Rosa, Guatemala, altitude about 1,400 meters, in September, 1893, by Heyde and Lux (J. D. Smith, no. 6133).

Originally distributed as *Cassia grammica* Spreng., a South American species, the determination by Micheli. That species, however, has pubescent leaflets and larger flowers, and the leaflets are smaller and of different form. The Guatemalan plant is related to *Chamaecrista pilosa* and *C. serpens;* from the former it differs in having petiolar glands and from the latter in its larger, glabrous leaflets, much larger, broader stipules, and elongated, many-seeded legume.

Calliandra mollis Standley, sp. nov.

Stems herbaceous, erect or ascending, stout, branched, abundantly villous with tawny hairs; stipules triangular-ovate or triangular-lanceolate, acute, 5 to 7 mm. long, striate, pilose; rachis of the leaves 50 to 65 mm. long, villous with tawny hairs; pinnæ 4 to 6 pairs, 25 to 55 mm. long; leaflets 7 to 22 pairs, approximate, narrowly oblong, 8 to 18 mm. long, 2.5 mm. wide, obtuse, apiculate, oblique at the base, densely pilose with white hairs on both surfaces; inflorescence of terminal or axillary racemes, each of several or numerous heads; peduncles slender, 15 to 32 mm. long, densely villous with tawny hairs; bracts

conspicuous, triangular-lanceolate, acute, striate, ciliate, pilose; calyx subsessile, 2 mm. long, glabrous, cleft nearly to the base into triangular-oblong acutish lobes; corolla glabrous, about 4 mm. long, the lobes oblong, acute; stamens 15 to 20 mm. long; legumes about 8 cm. long, 6 or 7 mm. wide, rounded-obtuse, short-beaked, attenuate at the base, densely pilose with tawny hairs, about 8-seeded.

Type in the U. S. National Herbarium, no. 578114, collected in thickets near Nicoya, Costa Rica, in January, 1900, by A. Tonduz (Inst. Fís. Geogr. Costa Rica, no. 13536). Additional material is mounted on sheet 577750.

Closely related to *Calliandra portoricensis* and *C. tetragona*, but easily distinguished from both by the copious pubescence. In both of those species the fruit is glabrous. The leaflets are similar in form to those of *C. tetragona*, being broader than those of *C. portoricensis*.

Mimosa maxonii Standley, sp. nov.

A vine with slender terete green glabrous branches armed with numerous slender recurved spines 2 mm. long; stipules triangular-lanceolate, 3 to 4 mm. long, prominently nerved, pectinate-ciliate; petioles 30 to 55 mm. long, slender, glabrous, bearing very numerous slender recurved spines; pinnæ 2 pairs, their rachises about 1 cm. long, slightly puberulent, yellow-setose at the point of insertion of the leaflets; leaflets 2 pairs, unequal, the inner leaflet of the lower pair much reduced, all elliptic-lanceolate or oblong-lanceolate, 38 mm. long or less, 4 to 11 mm. wide, acute or acuminate, rounded or obtuse and very unequal at the base, with a strongly excentric midvein, glabrous on the upper surface, beneath glabrous or with a few scattered setose-strigose yellowish hairs, the margin appearing nerved from the presence of a series of overlapping spiny-strigose hairs; peduncles 10 to 27 mm. long, divergent or ascending, stout, sparingly spiny; bracts of the spherical inflorescence (5 to 6 mm. in diameter) linear-lanceolate, about equaling the flowers, each with a rigid subulate tip; corolla glabrous, smooth, 2 mm. long; stamens 5; fruit oblong or narrowly oblong, 18 to 25 mm. long, 6 to 8 mm. wide, obtuse or abruptly acute, bearing a beak 1 mm. long, subsessile, 2 to 4-seeded, spiny-setose on the margins, the spreading setæ 3 to 5 mm. long, the valves finely and very densely velvety-pubescent, articulate.

Type in the U. S. National Herbarium, no. 473478, collected in the vicinity of Mazatenango, Guatemala, altitude about 350 meters, February 20, 1905, by William R. Maxon and Robert Hay (no. 3497).

Related to *Mimosa velloziana* Mart., but readily distinguished by the velvety-pubescent valves of the fruit.

Erythrina lanceolata Standley, sp. nov.

A small, densely branched tree; branches slender, grayish, closely armed with stout, dark brown spines about 4 mm. long; petioles slender, striate, 45 to 60 mm. long, swollen at the base, armed with numerous short stout spines, glabrous; petiolules stout, 5 or 6 mm. long; leaflets rather thick and firm, dull green, lanceolate or rhombic-lanceolate, 7 to 11 cm. long, 28 to 44 mm. broad, rather abruptly acuminate, cuneate or broadly cuneate at the base, glabrous, 3-nerved, with a few lateral nerves from the midvein, the veins conspicuous and more or less reticulate, the lateral leaflets slightly smaller than the terminal one and inequilateral; racemes 5 to 17 cm. long, rather slender, few-flowered, the rachises at first tomentulose but soon glabrate; pedicels 5 mm. long or shorter; calyx tubular-campanulate, 8 mm. long or less, obtuse at the base, shallowly 2-lipped, the upper lip retuse, obscurely tomentulose, soon glabrate; banner green and red, about 6 cm. long, 9 mm. wide, linear-oblong, straight, glabrous; keel petals distinct, 45 mm. long,

abruptly acute at the base, with a short acute triangular beak at the apex, undulate-margined; wings oblong, obtuse, about equaling the keel; stamens 10, 9 of the filaments adnate for nearly half their length, the tenth free nearly to the base; ovary tomentulose.

Type in the U. S. National Herbarium, no. 678761, collected at San Cristóbal de Candelaria, province of Cartago, Costa Rica, altitude 1,700 meters, by C. Wercklé (H. Pittier, no. 3693).

Similar to *Erythrina americana* Mill. in the form of the flowers, but differing in the short calyx, slender branches, and narrow leaflets. The leaflets are much narrower than those of any other American species.

Dolicholus pittieri Standley, sp. nov.

Stems twining, stout, woody, the younger ones terete, densely viscid-tomentose with short yellow hairs; stipules lanceolate, acute, 4 to 5 mm. long, densely tomentose, soon deciduous; petioles 2 to 3 cm. long, densely viscid-tomentose; stipellæ 2 mm. long, subulate; petiolules about 2 mm. long; leaflets oblong or oblong-lanceolate to ovate, 40 to 65 mm. long, 22 to 33 mm. wide, abruptly acute, rounded to subcordate at the base, dull green, thick and subcoriaceous, glandular on the upper surface and softly pubescent with fine short hairs, conspicuously reticulate-veined beneath and abundantly tomentose with short tawny hairs; racemes axillary, stout, 12 to 17 cm. long, the rachises densely viscid-tomentose, the few flowers rather distant; bracts decidous, lanceolate, shorter than the buds; calyx about 2 mm. long, about equaling the corolla, the lobes linear or linear-lanceolate, attenuate, the lowest much longer than the others, all several times longer that the short campanulate tube, the whole calyx densely glandular-pubescent; corolla pale yellow, the banner obovate, emarginate, glabrous, the keel and wings of about the same length; legume 3 to 4 cm. long, 1 cm. broad, straight along the upper suture, curved below, broadest toward the apex, acute, short-beaked, glandular and viscid-hirsute with tawny hairs; seeds 2, mature ones not seen.

Type in the U. S. National Herbarium, no. 530856, collected around Calí, western side of Cauca Valley, State of Cauca, Colombia, altitude 1,000 to 1,200 meters, December, 1905, by H. Pittier (no. 668).

In general appearance this is similar to *Dolicholus discolor* (Mart. & Gal.) Rose, a plant of Guatemala and southern Mexico. It differs in its viscid pubescence, narrower and longer calyx lobes, and glabrous banner.

TWO NEW SPECIES OF LEIPHAIMOS.

Leiphaimos, better known by the name Voyria, is a remarkable genus of the Gentianaceae which might well be taken as the type of a distinct family, as has been suggested. The plants differ from other Gentianaceae in being colorless parasites whose leaves are reduced to scales. A large number of species are known from the humid forests of northern South America and a few from tropical North America.

Leiphaimos costaricensis Standley, sp. nov.

Stems slender, succulent, terete, glabrous, erect, simple, 7 to 13 cm. high, one-flowered; cauline scales 4 or 5 pairs, distant, 5 to 6 mm. long, connate for about one-third their length, narrowly oblong, acute, subulate-tipped, glabrous; calyx subtended at the base by a pair of connate scales similar to the cauline ones, or the flowers sometimes short-pedunculate; calyx 7 mm. long, cleft one-

third the distance to the base, the tube cylindric-campanulate, the lobes oblong-linear to narrowly triangular, acuminate; corolla yellow, the tube slenderly cylindric, dilated in the throat for about 6 mm., 35 to 45 mm. long, about 1 mm. in diameter, puberulent within; corolla lobes elliptic to narrowly elliptic-lanceolate, 10 to 12 mm. long, 2 mm. wide or less, acuminate, conspicuously veined, spreading or somewhat reflexed, puberulent at the base on the inner surface; corolla tube bearing at the base outside a cuplike appendage adherent to the tube, this 1.25 mm. high, with obtusely 5-toothed margin; anthers sessile, broadly oblong, united by their edges, 1.25 mm. long, not appendaged; style stout, 20 to 22 mm. long, puberulent, flattened and very narrowly winged; stigma capitate, 1.5 mm. in diameter and about as high, convolute and tuberculate on the upper surface; capsules sessile, 11 mm. long, 2 mm. in diameter, linear-oblong in outline, acutish at the base, tapering gradually to the base of the style.

Type in the U. S. National Herbarium, no. 365960, collected in the Helechales del General, Diquís Valley, Costa Rica, altitude 700 meters, February 2, 1898, by H. Pittier (Inst. Fís. Geogr. Costa Rica, no. 12010).

Related to *Leiphaimos aphylla* (Jacq.) Gilg, one of the most widely dispersed members of the genus. That species has much broader and shorter corolla lobes and free anthers.

Leiphaimos oreophila Standley, sp. nov.

Stems slender, terete, glabrous, erect, simple, 6 to 8 cm. high, commonly twisted, one-flowered; cauline scales usually 5 pairs, 5 mm. long, connate for half their length, the free portion lance-oblong or narrowly triangular, acuminate, glabrous; peduncles stout, 3 to 11 mm. long; calyx tubular, somewhat inflated by the maturing capsule, 6 mm. long, 1.5 mm. in diameter, the teeth one-half as long as the tube or less, triangular, acute or acutish, a discoid gland borne inside the calyx near the base, one below each lobe; corolla apparently yellow, the tube cylindric, 11 mm. long, 1.5 mm. in diameter, dilated in the throat; corolla lobes 6 to 8 mm. long, linear-oblong or oblong, obtuse or acutish; anthers sessile, oblong or oblong-cuneate, 1 mm. long, each lobe with a slender pubescent appendage slightly longer than the body of the anther; style slender, 6 to 7 mm. long; stigma discoid, obscurely tuberculate, 1 mm. in diameter; capsule lanceolate in outline, attenuate upward, 5 mm. long, sessile.

Type in the U. S. National Herbarium, no. 600079, collected around San Andrés de la Sierra, western slope of the Cordillera de Santa Marta, State of Magdalena, Colombia, altitude 1,100 to 1,300 meters, June 1 to 6, 1906, by H. Pittier (no. 1676).

Because of its appendaged anthers this falls at once into the subgenus Leianthostemon, but it differs from the species heretofore included in that group in having the anthers sessile. It slightly resembles *L. sulphurea* (Progel) Gilg, but the form of the corolla and calyx is very different. *Leiphaimos oreophila* has a higher altitudinal range than most species of the genus, the greater number of them being natives of lowland forests.

THE GENUS SOMMERA.

The genus Sommera, a member of the Rubiaceae, was published by Schlechtendahl in 1835,[1] a single species, *S. arborescens*, being described, based upon a plant collected in Mexico by Schiede. An-

[1] Linnaea 9: 602. 1835.

other species was described by Schumann in 1889, from northwestern Brazil.

Heretofore all material of this genus from Central America has been referred, without hesitation, to *Sommera arborescens*. Examination of a sheet of the type collection in the U. S. National Herbarium shows that the Mexican plant is very different from any of the Central American specimens. Schlechtendahl states that in his specimens the cymes are 3 to 5-flowered, and in our Mexican specimens this number is never exceeded, while the flowers are closely aggregated at the end of the peduncle. All of our other specimens, however, have an open, broad, many-flowered cyme.

The most striking peculiarity of the genus is the lineolate appearance of the tissue between the reticulate veins. This is characteristic, also, of the closely related genus Watsonamra, several species of which are found in Central America.

KEY TO THE SPECIES.

Style glabrous at the apex ..... 1. *S. sabiceoides.*

Style pilose at the apex.

Cymes 3 to 5-flowered; calyx lobes lanceolate or oblong-lanceolate, acuminate ..... 2. *S. arborescens.*

Cymes many-flowered; calyx lobes oblong to broadly oblong or ovate, from broadly rounded to merely acute at the apex.

Bracts of the inflorescence broadly ovate to oblong, obtuse or shortly and abruptly acuminate; calyx lobes longitudinally veined, the veins not conspicuously reticulate; peduncles slender, 2 to 5 cm. long ..... 3. *S. guatemalensis.*

Bracts of the inflorescence lance-ovate to linear, attenuate or long-acuminate at the apex; calyx lobes conspicuously reticulate-veined; peduncles stout, 8 to 15 mm. long.

Leaf blades oval to broadly oblong-obovate, not more than twice as long as broad, round or broadly cuneate at the base, pubescent beneath with very short appressed hairs, the surface not velvety to the touch; bracts lance-ovate or lanceolate, without green tips; corolla tube sparingly pubescent outside ..... 4. *S. donnell-smithii.*

Leaf blades oblanceolate to elliptic-oblanceolate or rarely obovate, usually much more than twice as long as broad, cuneate to attenuate at the base, pubescent beneath with long and usually spreading hairs, somewhat velvety to the touch; bracts mostly linear or lance-linear, with green tips; corolla tube densely pubescent outside ..... 5. *S. mesochora.*

1. **Sommera sabiceoides** Schum. in Mart. Fl. Bras. 6[6]: 300. *pl. 133. f. 1.* 1889.

The type was collected by Martius along the River Yapurá, State of Amazonas, northwestern Brazil. Apparently, it is known only from this single collection.

2. **Sommera arborescens** Schlecht. Linnaea 9: 602. 1835.

Type collected by Schiede (no. 272) near the Hacienda de la Laguna, southern Mexico.

ILLUSTRATIONS: Schum. in Engler & Prantl, Pflanzenfam. 4[4]: *f. 26. J, K.*

SPECIMENS EXAMINED:

MEXICO: Hacienda de la Laguna, *Schiede* 272, type collection. Barranca Tenampa, near Zacuapan, Vera Cruz, in damp forests, *Purpus* 2062.

3. **Sommera guatemalensis** Standley, sp. nov.

Young branches terete or nearly so, succulent, sparingly strigose; stipules narrowly lanceolate, 35 to 45 mm. long, long-attenuate, thin, brown, strigose along the midvein and margin; petioles 2 to 5 cm. long, strigose; leaf blades oblong-obovate to oval, 17 to 32 cm. long, 8 to 14 cm. wide, rounded to broadly cuneate at the base, abruptly short-acuminate, the tip 15 to 20 mm. long, acute, densely strigose on both surfaces when young, in age glabrate on the upper surface, strigose beneath with very short hairs; peduncles relatively slender, 2 to 5 cm. long, many-flowered, the flowers in a rather dense cyme with several branches; bracts broadly ovate to oblong, obtuse or abruptly acuminate, thin, brown, finely parallel-veined, strigose along the midnerve, ciliate; flowers sessile or very shortly pediceled; ovary densely strigose; calyx lobes 3 to 6 mm. long, unequal, oval to broadly ovate, obtuse or acute, longitudinally nerved, finely strigillose on both surfaces; corolla tube 6 to 8 mm. long, densely pubescent outside above the calyx, densely villous within above the middle, the lobes one-fifth to one-third as long as the tube, triangular-ovate, acute; filaments inserted about the middle of the tube, somewhat longer than the oblong anthers; pistil stout, pilose above; fruit elongate-spherical, 12 mm. long and 9 or 10 mm. in diameter, sparingly strigose, capped with the persistent calyx.

Type in the U. S. National Herbarium, no. 398487, collected near Cubilquitz, Department of Alta Verapaz, Guatemala, altitude 350 meters, May, 1902, by H. von Türckheim (J. D. Smith, no. 8225).

ADDITIONAL SPECIMENS EXAMINED:

GUATEMALA: Pansamalá, Department of Alta Verapaz, alt. 1,140 meters, April, 1889, *J. D. Smith* 1737.

Distinguished from the other Central American species by the broad bracts and the long peduncles, as well as by the large and broad leaves.

4. **Sommera donnell-smithii** Standley, sp. nov.

Branches stout, terete, densely pubescent with long ascending tawny hairs; stipules 15 to 20 mm. long, lanceolate or ovate-lanceolate, acuminate, thin, brown, strigose along the midvein and margins or glabrate, ciliate; petioles 1 to 2 cm. long, densely strigose with tawny hairs; leaf blades oval to oval-obovate, 11 to 20 cm. long, 5 to 10 cm. wide, abruptly acuminate, the tips 15 to 20 mm. long, acute, rounded or broadly cuneate at the base, glabrous or remotely strigillose on the upper surface, sparingly pubescent beneath with very short appressed hairs, strigose-ciliate; peduncles 9 to 12 mm. long, stout, densely pubescent with tawny, appressed or ascending hairs; cymes many-flowered, with several stout divaricate branches, the flowers crowded at the ends of the branches, nearly sessile, but the pedicels in fruit 3 to 8 mm. long; bracts lanceolate to lance-ovate, acute to attenuate, thin, brown, strigose; ovary densely strigose; calyx lobes 3 mm. long or less, broadly oval or oblong, rounded at the

apex or obtuse, sparingly strigose, green, conspicuously reticulate-veined; corolla 5 to 7 mm. long, the tube minutely strigillose outside, densely villous within, the lobes about one-fourth as long as the tube, ovate, obtuse; style almost glabrous; fruit nearly spherical, 9 mm. in diameter, sparingly strigose.

Type in the U. S. National Herbarium, no. 245836, collected near Alajuelita, Province of San José, Costa Rica, altitude 990 meters, March, 1894, by John Donnell Smith (no. 4771).

ADDITIONAL SPECIMENS EXAMINED:

COSTA RICA: Alajuela, Province of Alajuela, alt. 900 meters, March, 1896, *J. D. Smith* 6592.

5. **Sommera mesochora** Standley, sp. nov.

Tree, about 8 meters high; young branches stout, terete, densely pubescent with loose tawny hairs; stipules 20 to 35 mm. long, lance-ovate, attenuate, thin and scarious, sparingly strigose along the midnerve and margins, strigose-ciliate; petioles 10 to 25 mm. long, densely pubescent with long loose hairs; leaf blades 12 to 22 cm. long, 3.5 to 8 cm. wide, oblong-oblanceolate to oblong-obovate, acuminate, sometimes rather abruptly so, gradually tapering from one-third the distance below the apex to a cuneate or very acute base, sparingly pubescent on the upper surface with very short appressed hairs, beneath rather densely pubescent with long, slender, loose or spreading, whitish hairs, ciliate; peduncles 10 to 15 mm. long, densely pilose; cymes many-flowered, with several divaricate branches, the flowers rather densely clustered at the ends of the branches, short-pediceled; bracts linear or lance-linear, the tips green, conspicuously reticulate-veined, abundantly pubescent with long loose hairs; ovary densely pubescent with long loose whitish hairs; calyx lobes 3 to 4 mm. long, oblong to broadly ovate, acutish to broadly rounded at the apex, strigose, conspicuously reticulate-veined; corolla white, 5 to 8 mm. long, densely and finely pubescent outside, loosely villous inside, the lobes one-fourth to one-third as long as the tube, oblong, obtuse or acutish; style densely pilose at the apex; filaments inserted near the middle of the tube, about as long as the anthers; fruit not seen.

Type in the U. S. National Herbarium, no. 675326, collected in a wet forest ravine, near El Boquete, Chiriquí, Panama, altitude 1,000 to 1,300 meters, March 2 to 8, 1911, by William R. Maxon (no. 4941).

ADDITIONAL SPECIMENS EXAMINED:

PANAMA: Near El Boquete, Chiriquí, alt. 1,000 to 1,300 meters, *Pittier* 3137.

COSTA RICA: Las Cruces de Boruca, February 19, 1898, *Pittier* (Inst. Fís. Geogr. Costa Rica, no. 12071). Cañas Gordas, alt. 1,100 meters, February, 1897, *Pittier* (Inst. Fís. Geogr. Costa Rica, no. 11155).

This is closely related to the preceding species, but seems distinct in its long, narrow leaves of different outline, the densely pilose style, the long and loose pubescence, and the narrow, green bracts.

NOTHOPHLEBIA, A NEW GENUS OF RUBIACEAE FROM COSTA RICA.

Among the plants in the U. S. National Herbarium collected in Costa Rica by Mr. H. Pittier the writer has found one which at first glance recalls the genus Watsonamra, especially in the form of the leaves, these having the lineolate appearance or "Moiréestreifung" characteristic of a group of four genera of the tribe Mussaendeae. Although the specimen is only in flower, the form of the ovary clearly indicates that the plant is a member of this tribe, but

the form of the flowers is so different from that of Hippotis, Sommera, Watsonamra, or Tammsia, that the Costa Rican plant must become the type of a new genus.

NOTHOPHLEBIA Standley, gen. nov.

Tree with large opposite leaves, these petiolate, the blades leathery, entire, nearly glabrous, the leaf tissue finely lineolate between the veins; stipules large, distinct; flowers bracteate, rather large, in axillary many-flowered pedunculate cymes; calyx tube campanulate, as broad as long, very obscurely 5-lobed, the margins faintly crenulate, naked within; corolla funnelform, the tube gradually widening upward, the 5 lobes valvate, much shorter than the tube, leathery; stamens 5, inserted near the base of the tube, the filaments slender, flexuous, unequal, pilose at the base, the anthers introrse, oblong, attached near the base, obtuse at the apex, caudate at the base, included; disk cupulate, 5-lobed; ovary 2-celled, the ovules numerous, compressed, inserted on elongated placentæ adnate to the septum; style slender; stigmas oblong or lanceolate.

Nothophlebia is most nearly related to Watsonamra, but it differs decidedly in the form of the calyx, that genus having a tubular and conspicuously toothed calyx or a tubular-campanulate and deeply lobed one. The corollas are very different in the two, the tube being cylindric in Watsonamra and obconic in Nothophlebia.

The name refers to the striæ of the leaves, which falsely appear to be a part of the venation.

Nothophlebia costaricensis Standley, sp. nov.

Tree with a depressed crown; young branches stout and fleshy, obtusely quadrangular, glabrous; stipules 35 to 40 mm. long, lance-oblong, attenuate, sparsely strigillose-puberulent, glabrous within; petioles stout, 40 to 55 mm. long, nearly glabrous, sparingly tuberculate near the base; leaf blades oval or obovate-oval, about 33 cm. long and 17 cm. wide, obtuse, acuminate at the base, leathery, glabrous, or very obscurely pubescent upon the veins beneath with appressed hairs, the veins prominent, about 12 on each side, dichotomous near the margin; cymes many-flowered, loosely branched, the branches minutely puberulent and tuberculate, the peduncle 2 cm. long and the secondary branches of about the same length; pedicels 7 mm. long or less, some of the flowers sessile; bractlets at the base of the flowers subulate, 2 mm. long; ovary turbinate, 4 mm. long, strigillose; calyx 4 to 5 mm. long and of about the same diameter, minutely puberulent outside, glabrous within; corolla tube 2 cm. long, 3.5 mm. thick at the base, expanding to 8 or 9 mm. in the throat, glabrous outside near the base, puberulent above, glabrous within except at the point of insertion of the stamens, there pilose; corolla lobes spreading, ovate, acute or acutish, 4 to 5 mm. long, densely puberulent outside, glabrous within or nearly so; filaments inserted 2 mm. above the base of the tube, 9 to 10 mm. long; anthers 2.5 long; style 1 cm. long, the stigmas about 2 mm. long.

Type in the U. S. National Herbarium, no. 578472, collected on Collines de Moin, Atlantic coastal belt, Costa Rica, November, 1899, by H. Pittier (Inst. Fís. Geogr. Costa Rica, no. 16024).

Only a few bracts are present upon the inflorescence, showing that they are early deciduous. There is no indication that any are ever present except at the base of the ovary or pedicel.

A REVISION OF THE GENUS WATSONAMRA.

The name Pentagonia was applied by Bentham in 1844 to a rubiaceous plant collected by Hinds in Panama, which he called *Pentagonia macrophylla*. Unfortunately this generic name had been used twice before, Pentagonia having been applied by Ventenat in 1841 to a member of the Campanulaceae and Pentagonium by Schauer in 1843 to an asclepiad.

In the Kew Index, as well as in Dalla Torre and Harms's Genera Siphonogamarum, Seemannia of Hooker[1] is cited as a synonym of Pentagonia, dating from 1848. Upon investigating this reference one finds that Seemannia was scarcely published here, Hooker merely saying in discussing *Pentagonia pinnatifida*, " * * * should future observations discover marks sufficient to constitute of our present plant a new genus, I can not but wish it should have the name of its discoverer, *Seemannia*." A genus of the Gesneriaceae was named Seemannia by Regel in 1855.

The two works cited also list Megaphyllum Spruce as a synonym of Pentagonia, but this was cited by Baillon as a synonym,[2] hence is not published. It is not clear what the plant is to which Spruce applied the name of Megaphyllum, for the writer has not found a citation in literature of Spruce's number mentioned by Baillon.

Otto Kuntze, in 1891, finding the rubiaceous group to be without a name, designated it as Watsonamra, in honor of Dr. Sereno Watson. This is the name that apparently must stand for the genus.

Heretofore six species of Pentagonia, or Watsonamra, have been described from Central America and northwestern South America. The recent collections of this genus in Panama comprise a more extended series of specimens than has been brought together heretofore. Among the collections of Mr. Pittier and Mr. Williams the writer has found four plants that seem different from those already described. A plant from Costa Rica, distributed as *Pentagonia wendlandi*, also appears to be new. Thus the number of known species is increased to eleven.

Watsonamra is remarkable because of the venation of the leaf blades, the tissue being finely lineolate between the reticulate veins. When a piece of the blade is broken, the fragments are held together by the fine white threads drawn from the striæ. The genus is not peculiar in this respect, a few other members of the family exhibiting the same structure. It is remarkable, however, in containing the only members of the Rubiaceae which have pinnatifid leaves.

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[1] Lond. Journ. Bot. 7: 567. 1848.

[2] Hist. Pl. 7: 456. 1880.

WATSONAMRA Kuntze.

Peniagonia Benth. Bot. Voy. Sulph. 105. *pl. 39.* 1844, not Vent. 1841.
Watsonamra Kuntze, Rev. Gen. Pl. 1: 302. 1891.
Type species, *Pentagonia macrophylla* Benth.

KEY TO THE SPECIES.

Leaves entire.
- Leaf blades sessile or subsessile.
  - Corolla red, the lobes spreading; calyx lobes not more than half as long as the tube ..... 1. *W. magnifica.*
  - Corolla yellow, the lobes erect; calyx lobes as long as the tube ..... 2. *W. wendlandi.*
- Left blades on long petioles.
  - Calyx not glandular within ..... 3. *W. spathicalyx.*
  - Calyx glandular within.
    - Leaves finely soft-pubescent on both surfaces; corolla hirtellous ..... 4. *W. pubescens.*
    - Leaves glabrous, or the veins beneath appressed-pubescent; pubescence of the corolla appressed.
      - Bracts deciduous; corolla lobes oblong, twice as long as broad, densely pubescent outside; calyx tube campanulate ..... 5. *W. donnell-smithii.*
      - Bracts persistent; corolla lobes ovate, nearly as broad as long, sparsely pubescent; calyx tube turbinate .. 6. *W. macrophylla.*

Leaves pinnatifid.
- Petioles not auriculate at the base.
  - Inflorescence closely sessile, many-flowered; petioles winged to the base; fruit densely tuberculate ..... 10. *W. tinajita.*
  - Inflorescence short-pedunculate, few-flowered; petioles winged on the upper half, naked below; fruit sparsely tuberculate ..... 11. *W. gymnopoda.*
- Petioles auriculate at the base.
  - Calyx 30 mm. long, tubular, appendaged within at the base, the lobes 3 mm. long or less; corolla only slightly exceeding the calyx .. 7. *W. pinnatifida.*
  - Calyx 12 to 20 mm. long, cylindric-campanulate or tubular, not appendaged within, the lobes one-third as long as the tube or longer; corolla twice as long as the calyx or longer.
    - Auricles nearly half as long as the petioles; calyx tubular, 20 mm. long, the lobes one-third as long as the tube; inflorescence many-flowered; bracts oblong or narrowly oblong, 10 to 20 mm. long .. 8. *W. pittieri.*
    - Auricles less than one-fourth as long as the petioles; calyx cylindric-campanulate, 15 mm. long, the lobes half as long as the tube; bracts broadly ovate, 5 to 10 mm. long ..... 9. *W. brachyotis.*

1. **Watsonamra magnifica** (Krause) Standley.

Pentagonia magnifica Krause, Bot. Jahrb. Engler **40**: 325. 1908.

TYPE LOCALITY: Along the Rio Timbiqué, Colombia.

RANGE: Panama and Colombia.

SPECIMENS EXAMINED:

COLOMBIA: Along the Rio Timbiqué, March, 1889, *Lehmann* 8886. type collection (in herb. N. Y. Bot. Gard.).

PANAMA: Along the Rio Culebra, above Santa Isabel, Province of Colon, near sea level, *Pittier* 4158.

It is impossible to be certain that the Panama specimen is of this species, since it is in fruit, and even the persistent calyces are mutilated so that their form can not be determined definitely. Krause describes the fruit as being perfectly spherical and 12 to 15 mm. in diameter. In the Panama plant it is ovoid-spherical, about 22 mm. in diameter and 24 to 28 mm. high, and finely striate longitudinally. The specimen of the type collection in the herbarium of the New York Botanical Garden has no fruit. The inflorescence is described as sessile, but in this specimen the peduncle is a centimeter long. In the plant from Panama the peduncles are even longer. It is very probable that, when the flowers of the latter are collected, it will be found to be an undescribed species. The single leaf of Mr. Pittier's collection is 78 cm. long and 29 cm. wide in the broadest part.

2. **Watsonamra wendlandi** (Hook.) Kuntze, Rev. Gen. Pl. **1**: 302. 1891.

Pentagonia wendlandi Hook. Curtis's Bot. Mag. **87**: *pl. 5230*. 1861.

TYPE LOCALITY: The plant was described from cultivated specimens. Hooker states that it was brought by Wendland from some part of Central America. Hemsley[1] gives the locality as Central Mexico, but this is probably a slip of the pen for Central America, since many such lapses are found in the Biologia.

3. **Watsonamra spathicalyx** (Schum.) Kuntze, Rev. Gen. Pl. **1**: 302. 1891.

Pentagonia spathicalyx Schum. in Mart. Fl. Bras. **6**[6]: 302. 1889.

TYPE LOCALITY: In forests along the River Yapurá and near Ega, State of Amazonas, northwestern Brazil. Type collected by Martius.

Described from fruiting specimens; the corolla has not been seen.

4. **Watsonamra pubescens** Standley, sp. nov.

A small tree, 3 to 4 meters high; young branches thick and succulent, hirtellous; stipules not seen; petioles naked, 4 to 10 cm. long, densely hirtellous with short hairs; leaf blades oval-obovate to elliptic-oval, 26 to 48 cm. long, 12 to 23 cm. wide, acute, rounded to acute at the base, densely pubescent on both surfaces with fine short spreading hairs, velvety to the touch, conspicuously veined, with 12 to 14 veins on each side, these branching near the margin; cymes subsessile or the peduncles 5 mm. long, few-flowered, the branches densely pubescent; pedicels 2 or 3 mm. long, very stout; bracts oblong to broadly ovate, 10 to 15 mm. long, obtuse, finely nerved, appressed-pubescent on the outer surface; ovary 6 mm. long; calyx about 18 mm. long, the tube turbinate, densely pubescent with appressed hairs, the lobes rounded at the apex, sparingly pubescent on the outer surface, the tube glandular within; corolla tube slenderly cylindric, 25 mm. long, 3.5 mm. in diameter, hirtellous outside, villous within, the lobes ovate, acute, 5 mm. long; stamens inserted 7 mm. above the base of the tube, the filaments slender, villous; style 18 mm. long, pilose above; immature fruit spherical, 12 to 14 mm. in diameter, crowned by the persistent and accrescent calyx, vertically striate, densely hirtellous.

[1] Biol. Centr. Amer. Bot. **2**: 38. 1881.

Type in the U. S. National Herbarium, no. 678894, collected along the railroad near Tabernilla, Canal Zone, Panama, altitude 20 to 25 meters, July 6, 1911, by H. Pittier (no. 3822).

Easily distinguished from all other species by the densely pubescent leaves and hirtellous corolla.

5. Watsonamra donnell-smithii Standley, sp. nov.

Young branches stout, glabrate or sparingly strigillose; stipules about 5 cm. long and 2.5 cm. broad, ovate, acuminate or attenuate, densely and finely silky-strigillose on the outer surface, glabrous on the inner surface; petioles 9 to 11 cm. long, minutely strigillose, naked; leaf blade (a single one seen) entire, oval, 45 cm. long, 28 cm. wide, obtuse at the base, glabrous above, glabrous beneath except along the finely silky-strigose veins, these conspicuous, 14 on each side; cymes rather densely many-flowered, on stout peduncles 10 to 13 mm. long; bracts not seen, evidently early deciduous, or possibly wanting; pedicels very stout, 4 to 6 mm. long; ovary densely appressed-pubescent; calyx 12 to 15 mm. long, the tube campanulate, 5 to 7 mm. broad, finely pubescent with appressed hairs, glandular within near the base, the lobes about equaling the tube, obovate or oval-obovate, rounded at the apex, finely striate, sparingly pubescent outside, glabrous within; corolla tube 25 mm. long, 3.5 mm. in diameter, densely pubescent outside with short appressed hairs, except near the base, there glabrous, nearly glabrous within; corolla lobes 6 or 7 mm. long, oblong, about twice as long as broad, pubescent outside like the tube, but more densely so, glabrate within; stamens inserted 6 mm. above the base of the corolla tube, the slender filaments unequal, 11 mm. long or less, villous near the base; fruit not seen.

Type in the U. S. National Herbarium, no. 355176, collected near La Emilia, Llanuras de Santa Clara, Costa Rica, altitude 250 meters, April, 1896, by John Donnell Smith (no. 6590).

This was distributed as *Pentagonia wendlandi*, but is very unlike that plant. It is most closely related to *Watsonamra macrophylla*, but that species has persistent bracts, broader corolla lobes, and a very different calyx. The peduncles, pedicels, and bases of the petioles in the type are very densely beset with brownish, gland-like tubercles. A few similar tubercles are found on some of the specimens of closely related species.

6. Watsonamra macrophylla (Benth.) Kuntze, Rev. Gen. Pl. 1: 302. 1891.

Pentagonia macrophylla Benth. Bot. Voy. Sulph. 105. *pl. 39.* 1844.

TYPE LOCALITY: Panama. Type collected by Hinds.

RANGE: Canal Zone and vicinity, Panama.

SPECIMENS EXAMINED:

CANAL ZONE: Agua Clara, on the Trinidad River, alt. 10 to 40 meters, *Pittier* 3992. Matachín, June, 1874, *Kuntze.* Culebra, *Cowell* 217. Colon to Empire, *Joseph Crawford* 512.

Three meters high or less; leaves 25 to 60 cm. long; calyx red; corolla greenish.

7. Watsonamra pinnatifida (Seem.) Kuntze, Rev. Gen. Pl. 1: 302. 1891.

Pentagonia pinnatifida Seem. Lond. Journ. Bot. 7: 566. *pl. 18.* 1848.

TYPE LOCALITY: Banks of the River Cupica, State of Cauca, Colombia. Type collected by Seemann.

A small tree, about 3 meters high; larger leaves nearly a meter long and half as wide. This differs from all other species in the narrowly tubular corolla which extends only slightly beyond the calyx and in the peculiar interior appen-

dages of the calyx. It may be the type of a distinct genus, as suggested by Hooker, but in general appearance it is very similar to the other species with pinnatifid leaves.

8. Watsonamra pittieri Standley, sp. nov.

Stems stout and succulent, obtusely quadrangular, glabrate; stipules 55 mm. long, narrowly oblong, rather abruptly attenuate, finely pubescent outside with minute appressed hairs, glabrous within; petioles 14 to 17 cm. long, stout, smooth, minutely puberulent with appressed hairs, auriculate at the base, the purplish red auricles rounded, crispate, about 8 cm. long, undulate-margined, finely and sparsely strigose-puberulent, especially on the lower surface; leaf blades 68 cm. long or less (in the specimens), up to 58 cm. wide, truncate or obtuse at the base, pinnatifid about two-thirds the distance to the midrib, the lobes 4 or 5 on each side, ascending or subdivergent, narrowly oblong, acute or abruptly acute, the terminal lobe broader than the others, the blade glabrous throughout or minutely strigose-puberulent on the veins beneath; cymes few-flowered, on stout peduncles 25 mm. long or less; bracts oblong or narrowly oblong, 10 to 20 mm. long, acute, persistent, striate, finely appressed-pubescent outside, glabrous within, ciliate; flowers subsessile; calyx tubular, 20 mm. long, silky-strigose outside, glabrous and naked within, the lobes one-third as long as the tube or shorter, oblong-ovate, obtuse or acutish, ciliate; corolla tube much exserted (a perfect corolla not seen), sparingly puberulent; fruit subspherical, about 2 cm. in diameter, striate vertically, not tuberculate, strigose-puberulent.

Type in the U. S. National Herbarium, no. 679414, collected in forests around Puerto Obaldía, San Blas Coast, Panama, at an altitude of 50 meters or less, August, 1911, by H. Pittier (no. 4298). Additional material is mounted on sheet 679415.

The leaves of this species agree very well with those figured and described for *Watsonamra pinnatifida*. The form of the calyx, however, is very different in the two. Only a single mutilated corolla of *W. pittieri* has been seen, but this is sufficient to show that it is very unlike that of *W. pinnatifida*.

9. Watsonamra brachyotis Standley, sp. nov.

A small tree 3.5 meters high, the trunk 2.5 cm. in diameter; wood yellowish white; bark on the older stems grayish, slightly furrowed; young branches succulent, glabrous or nearly so; stipules not seen; petioles 8 to 10 cm. long, slender, strigose-puberulent, each bearing at the base 2 rounded reddish auricles 2.5 cm. long or less, these crispate, undulate-margined, strigose-puberulent; leaf blades (in the specimens examined) rhombic in outline, 33 to 37 cm. long, 42 to 46 cm. broad, obtuse at the base, glabrous on the upper surface, glabrous beneath except for the strigillose veins, pinnatifid nearly to the midvein, the lobes 3 on each side, narrowly oblong, 4 to 6 cm. wide, acuminate, the tips obtuse, the terminal lobe broader, oval-oblong or ovate; cymes closely few-flowered, very shortly pedunculate; bracts persistent, broadly ovate, 5 to 10 mm. long, acute or acutish, striate, brown, sparingly silky-strigose, ciliate; calyx cylindric-campanulate, 15 mm. long or less, sparingly silky-strigillose, the lobes half as long as the tube or more, ovate or oval, rounded at the apex, ciliolate; corolla tube slender, 30 mm. long, nearly glabrous outside, but with a few appressed hairs, glabrous within except at the insertion of the anthers, there pilose; corolla lobes spreading, 3 to 4 mm. long, ovate, acute or acutish; stamens inserted 8 mm. above the base of the tube, the filaments slender, pilose at the base, 10 mm. long or less; style 15 to 20 mm. long; fruit not seen.

Type in the U. S. National Herbarium, no. 678351, collected near Marraganti, Panama, April 3, 1908, by R. S. Williams (no. 999). Duplicate type in the herbarium of the New York Botanical Garden.

This is closely related to the preceding species, but seems amply distinct in the short auricles, short, broad calyx, broader and shorter bracts, and few-flowered cymes. The collector states that the leaves are sometimes a meter long and that the flowers are red.

10. Watsonamra tinajita (Seem.) Kuntze, Rev. Gen. Pl. 1: 302. 1891.

Pentagonia tinajita Seem. Bot. Voy. Herald 134. *pl. 28.* 1854.

TYPE LOCALITY: Near David, Province of Chiriquí, Panama. Type collected by Seemann (no. 1595).

RANGE: Province of Chiriquí, Panama.

SPECIMENS EXAMINED:

PANAMA: Vicinity of David, Chiriquí, alt. 30 to 80 meters, *Pittier* 3369. Vicinity of San Felix, eastern Chiriquí, alt. 0 to 120 meters, *Pittier* 5214.

A small tree, 2 to 4 meters high. According to Seemann, the native name is "tinajita" and the fruit is edible, but of an insipid flavor. The fruits are 10 to 17 mm. in diameter and densely tuberculate. The seeds are about 3 mm. long, obtusely angled, and few.

11. Watsonamra gymnopoda Standley, sp. nov.

A shrub, 2 to 2.5 meters high; young stems fleshy, stout, obtusely quadrangular, glabrous or nearly so; stipules 3 to 6 cm. long, oblong-ovate or lance-oblong, acuminate or attenuate, silky-strigillose outside, glabrous within; petioles 7 to 23 cm. long, slender, naked below, winged on the upper half, the wings 15 mm. wide or less, strigillose-puberulent or glabrate; leaf blades 54 to 68 cm. long, 66 to 72 cm. wide, ovate-triangular in outline, glabrous above, strigillose-puberulent along the veins beneath, pinnatifid nearly to the midrib, with 4 to 6 divisions on each side, these divergent, oblong-linear, 6.5 cm. wide or less, narrowed toward the base, gradually tapering toward the acute apex, prominently veined, the terminal one short and only slightly broader than the others; cymes densely few-flowered, on stout peduncles 6 to 9 mm. long; bracts oblong, obtuse or acute, 23 mm. long or less, sparingly strigillose-puberulent outside, ciliate; flowers not seen; fruit globose-ovoid, 14 mm. in diameter and 18 mm. high, sparsely tuberculate and puberulent, not striate; seeds numerous, brown, obtusely angled, minutely favose, 3 to 4.5 mm. long.

Type in the U. S. National Herbarium, no. 678935, collected in forests, Loma de Gloria, near Fató, Province of Colon, Panama, altitude 10 to 100 meters, in July or August, 1911, by H. Pittier (no. 3858). Additional material, consisting of young leaves, is mounted on sheet 678934.

This is most closely related to *Watsonamra tinajita*, but the petioles are not winged to the base, as in that species, the leaf segments are narrower, the inflorescence is pedunculate and fewer flowered, and the fruit is larger, of a different shape, and not densely tuberculate.

GEOCARDIA, A NEW NAME TO REPLACE GEOPHILA.

The name Geophila Don, applied in 1825 to a group of herbaceous plants of the family Rubiaceae, in antedated by Geophila Bergeret, given in 1803 to a member of the Liliaceae. No other name seems

ever to have been applied to the rubiaceous genus, although Mueller considered the species congeneric with Mapouria Aubl.[1] The genus being clearly distinct, the writer proposes the name Geocardia (alluding to the heart-shaped leaves borne on prostrate stems) as a substitute for the homonym Geophila.

GEOCARDIA Standley, nom. nov.

Geophila D. Don, Prodr. Fl. Nepal. 136. 1825, not Berg. 1803.

The following is a list of the principal American species. Several others have been described from Africa:

Geocardia cordata (Miq.) Standley.
Geophila cordata Miq. Linnaea **17**: 72. 1843.
Mapouria cordata Muell. Arg. in Mart. Fl. Bras. **6**^{5}: 426. 1881.

Geocardia herbacea (L.) Standley.
Psychotria herbacea L. Sp. Pl. ed. 2. 245. 1762.
Cephaelis reniformis H. B. K. Nov. Gen. & Sp. **3**: 377. 1818.

Geocardia macrocarpa (Muell. Arg.) Standley.
Mapouria macrocarpa Muell. Arg. in Mart. Fl. Bras. **6**^{5}: 425. 1881.

Geocardia picta (Rolfe) Standley.
Geophila picta Rolfe, Kew Bull. **1896**: 18. 1896.

Geocardia pleuropoda (Donn. Smith) Standley.
Geophila pleuropoda Donn. Smith, Bot. Gaz. **52**: 50. 1911.

Geocardia tenuis (Muell. Arg.) Standley.
Mapouria tenuis Muell. Arg. in Mart. Fl. Bras. **6**^{5}: 425. 1881.

Geocardia violacea (Aubl.) Standley.
Psychotria violacea Aubl. Pl. Guian. **1**: 145. *pl. 55*. 1775.
Geophila violacea DC. Prodr. **4**: 537. 1830.

Geocardia violaefolia (H. B. K.) Standley.
Cephaelis violaefolia H. B. K. Nov. Gen. & Sp. **3**: 379. 1818.
Geophila violaefolia DC. Prodr. **4**: 537. 1830.
Geophila herbacea Morong, Ann. N. Y. Acad. **7**: 129. 1893.
Geophila herbacea violaefolia Chod. & Hassl. Bull. Herb. Boiss. II. **4**: 180. 1904.

NEW RUBIACEAE FROM COLOMBIA AND COSTA RICA.

The following new species comprising one in each of the genera Cassupa, Gonzalagunia, Genipa, and Cosmibuena, have been noted in the large series of specimens collected by Mr. H. Pittier in Costa Rica and Colombia.

Cassupa pittieri Standley, sp. nov.

Small pyramidal tree, 4 to 5 meters high; young branches stout, obtusely quadrangular, densely tomentulose with tawny hairs; stipules 7 to 12 mm. long, triangular-lanceolate, attenuate, puberulent outside; petioles 4 to 5 cm.

[1] In Mart. Fl. Bras. **6**^{5}: 424. 1881.

long, stout, minutely puberulent; leaf blades oval, about 28 cm. long and 14 cm. wide, acuminate, abruptly short-acuminate at the base, the upper surface dark green and shining, glabrous except for the puberulent veins, beneath paler green, puberulent, especially along the veins, prominently nerved, about 22 parallel lateral veins on each side; panicle about 9 cm. long (excluding the corollas), many-flowered, the secondary branches stout, compressed, 25 mm. long or less, puberulent, the terminal flowers sessile, the others on pedicels 5 to 8 mm. long; bracts ovate to lanceolate, acute; ovary and calyx together 6 or 7 mm. long, glabrous or obscurely puberulent, the calyx margin minutely repand-denticulate; corolla white, the tube 57 mm. long, slightly dilated in the throat, glabrous and smooth near the base, above verrucose and puberulent, densely bearded within in the throat; corolla lobes 6, ovate or oval, 11 mm. long, 6 or 7 mm. wide, rounded or obtuse at the apex, puberulent, bearded within at the base, imbricated; filaments 3 mm. long; anthers 10 mm. long; style 55 mm. long, glabrous below, scaberulo-puberulent above; stigmas oblong, 5 mm. long; fruit not seen, the ovaries 2-celled.

Type in the U. S. National Herbarium, no. 530697, collected near Córdoba, Dagua Valley, State of Cauca, Colombia, in the Pacific coastal zone, altitude 30 to 100 meters, December, 1905, by H. Pittier (no. 514).

This resembles *Cassupa alba* Schum. & Krause in the color of its flowers, but the corolla is longer and is verrucose and puberulent outside and the leaves are green beneath instead of densely white-puberulent.

Gonzalagunia rugosa Standley, sp. nov.

Young branches terete, densely matted-tomentose with pale brownish hairs, becoming glabrate in age; stipules 3 to 4 mm. long, triangular, with subulate tips; petioles very stout, 4 to 7 mm. long, densely tomentose; leaf blades lanceolate or elliptic-lanceolate, 7 to 10 cm. long, 25 to 35 mm. broad, rather abruptly acuminate, rounded or obtuse at the base, thick and subcoriaceous, very conspicuously rugose, glabrous on the upper surface or tomentulose along the veins, densely matted-tomentose beneath with pale yellowish or brownish hairs; inflorescence a spike-like panicle 10 to 15 cm. long and about 1.5 cm. broad, on a peduncle 25 mm. long; bracts linear, about 7 mm. long, persistent, before anthesis divaricate and exceeding the branches of the panicle; flowers in short-pedunculate many-flowered approximate cymes; calyx 4-lobed, the lobes broadly triangular, obtuse, persistent, the calyx and ovary together about 1.5 mm. long, densely tomentose; pedicels about 1 mm. long; corolla 5 mm. long, densely tomentose outside, the tube stout-cylindric, the 4 lobes broadly rounded, villous within; filaments very short, inserted above the base of the tube; anthers oblong, 1.25 mm. long; style 3.5 mm. long, puberulent; stigma 4-lobed, capitate; fruit depressed-demispheric, 4-celled, 3 mm. in diameter, densely tomentose; seeds rather few, brown, favose.

Type in the U. S. National Herbarium, no. 531453, collected around Huila, an Indian village in the Rio Paez Valley, Tierra Adentro, State of Cauca, Colombia, altitude 1,600 to 1,900 meters, January, 1906, by H. Pittier (no. 1258).

Distinguished from the other South American species of the genus by the very short corolla, as well as by the long bracts and densely tomentose lower surface of the leaves.

Genipa codonocalyx Standley, sp. nov.

Tree; young branches stout and succulent, glabrous or nearly so; stipules triangular-ovate, 10 to 12 mm. long, abruptly acuminate; petioles short, 5 to 15

mm. long, cinereous-puberulent; leaf blades oblanceolate to oblong-oblanceolate, 12 to 17 cm. long, 4 to 7 cm. wide, abruptly short-acuminate, the obtuse tip 10 to 13 mm. long, attenuate to the base, shining and glabrous on the upper surface, dull beneath and hirtellous or puberulent along the veins, these prominent, 9 to 12 on each side; cymes sessile or nearly so, branched, many-flowered, the branches very stout, glabrate; bracts broadly ovate, obtuse, connate at the base; pedicels 3 to 7 mm. long; calyx and ovary together broadly campanulate, 5 to 9 mm. high, 6 to 9 mm. broad, glabrous, the truncate limb of the calyx with 5 minute and inconspicuous teeth; corolla tube 11 mm. long, gradually widening upward, glabrous outside for 3 mm. above the base, elsewhere densely pubescent with long tawny appressed hairs, long-bearded within; corolla lobes spreading, 15 mm. long, oblong-obovate or oval, rounded at the apex, densely sericeous outside, bearded on the lower half, especially along and near the midnerve; anthers subsessile, 15 mm. long, linear; style and stigma together 22 mm. long, the former papillose and bearded near the apex; fruit not seen.

Type in the U. S. National Herbarium, no. 577536, collected near Boca Matapalo, Pacific coastal belt, Costa Rica, at sea level, April 10, 1898, by H. Pittier (Inst. Fís. Geogr. Costa Rica, no. 12085). Corolla yellowish white; native name, *jagua*.

This differs from both *Genipa americana* and *G. caruto* in the short, broad calyx, as well as in the form of the bracts. The leaves are not densely pubescent beneath, as in the second species, nor glabrous, as in *G. americana*.

Cosmibuena arborea Standley, sp. nov.

A tree, 8 to 12 meters high, glabrous throughout; young branches stout, somewhat fleshy, grayish brown; stipules not seen; petioles 20 to 25 mm. long; leaf blades elliptic-obovate or elliptic-oblong, 9 to 11 cm. long, 42 to 56 mm. wide, thick and leathery, shining on the upper surface, rounded at the apex, cuneate or broadly cuneate at the base, with 7 to 9 parallel veins on each side, these not conspicuous; inflorescence terminal, of about 5 sessile flowers; stipules ovate or rounded-ovate, 10 to 15 mm. long, obtuse, thin; ovary oblong, about 12 mm. long, contracted into a stout stipe as long or longer; calyx cylindric, 10 to 13 mm. long, cleft two-fifths the distance to the base, the teeth somewhat unequal, oblong-triangular, acute, the whole calyx circumscissile, glandular within near the base; corolla tube slender, 6 to 7 cm. long, 3 to 4 mm. in diameter, gradually dilated toward the throat; corolla lobes 5, narrowly oblong, obtuse, 25 to 30 mm. long, 8 to 11 mm. wide, yellowish white; anthers sessile or nearly so, attached near the base, 2 cm. long, mucronate at the apex, with 2 short appendages at the base; style about 65 mm. long; stigma bilamellate; ovules numerous, winged, the wings laciniate.

Type in the U. S. National Herbarium, no. 531184, collected near Espejuelo, Cauca Valley, State of Cauca, Colombia, altitude 1,000 meters, January, 1906, by H. Pittier (no. 985).

Flowers very fragrant.

Related to *Cosmibuena triflora* as closely as to any species, but readily distinguished by the narrow corolla lobes, very obtuse leaves with longer petioles, and longer calyces.

A REVISION OF THE GENUS COBAEA.

The genus Cobaea of the Polemoniaceae as published by Cavanilles consisted of a single species, *C. scandens*, described from plants grown in the Royal Botanical Garden at Madrid from seeds received from Mexico. The only other generic name that has been given to a member of the group here discussed is Rosenbergia Örst., published in 1856, based upon *Rosenbergia gracilis*, which came from Costa Rica. Örsted believed that his plant belonged to a genus distinct from Cobaea, because of the elongated linear corolla lobes. A second species of Rosenbergia was published by Karsten in 1858. If no other members of the group treated here had been discovered it might naturally be divided into two genera; but later explorations have revealed intermediate forms, *Cobaea aschersoniana* Brand, especially, standing almost exactly midway between the types of Cobaea and Rosenbergia.

In 1908 Mr. H. D. House transferred all the species of Cobaea to Rosenbergia,[1] claiming that Cavanilles's generic name was invalidated by Cobaea Necker, published in 1790. Necker's name was applied to a group of Linnæan species of Lonicera sometimes known as Xylosteum; but it appears to be a hyponym, since it is not associable by citation with a previously published species. Consequently the name Cobaea is to be retained for the genus with which it has always been associated.

Cobaea is unique among the Polemoniaceae in having the leaves terminated by tendrils. Some authors have placed it in the Bignoniaceae, while others have considered it the type of a distinct family, the Cobaeaceae.

The species are all inhabitants of humid mountain forests of tropical and subtropical North and South America, ranging from the State of Nuevo León in Mexico south through Central America to northern Chile, Venezuela, and northwestern Brazil. So far as now known the species are of local distribution. *Cobaea scandens*, the most generally known species, has been found only within a small area in southern Mexico. Although a wide geographical range has been ascribed to certain species, it is probable that this is the result of hasty or careless determinations. Several have been introduced into cultivation in Europe and *C. scandens* is often seen in North America.

There are only three accounts of the genus that attempt to be complete. The first was published by Hemsley in The Garden in 1880.[2] This is a popular discussion of the group, although there are

[1] Mulenbergia 4: 22–25. 1908.

[2] 17: 352–353.

appended technical descriptions of two new forms. Hemsley lists 8 species. More recently the group has been monographed by Brand in Engler's Pflanzenreich.[1] Brand recognizes three sections which include 9 species and 1 subspecies. House, in the paper cited above, published a key to the known species, 11 in all, 1 of which he described as new. Examination of the material of the genus in the U. S. National Herbarium indicates the presence of several undescribed species, some of them very unlike any of these hitherto recognized. These new species, seven in all, are described in the accompanying enumeration, which includes all members of the genus so far as now known. It is probable that more extended exploration of the mountains of Central and South America will bring to light a number of additional species. The writer has seen no specimens from Colombia or Nicaragua, regions in which some of the species doubtless occur.

COBAEA Cav.

Cobaea Cav. Icon. Pl. 1: 11. *pl. 16, 17.* 1791. (Name misspelled "Cobbea" by Andrews and "Cobea" by Desfontaines.)
Rosenbergia Örst. Vid. Medd. Naturh. For. Kjøbenhavn 1856: 30. 1856.

KEY TO THE SPECIES.

Corolla lobes linear or with linear tip.
- Calyx lobes densely long-villous; corolla lobes ovate at the base, abruptly contracted into a long linear tip ..... 5. *C. aschersoniana.*
- Calyx lobes glabrous or minutely pilose; corolla lobes either linear or tapering gradually from the base.
  - Stamens shorter than the corolla; corolla lobes bifid at the apex ..... 2. *C. hookeriana.*
  - Stamens longer than the corolla; corolla lobes entire.
    - Corolla yellow; calyx segments villous-ciliate ..... 4. *C. gracilis.*
    - Corolla purple or greenish purple; calyx segments not villous-ciliate.
      - Calyx lobes minutely pilose, about equaling the corolla tube; stigmas very short; corolla lobes of about equal breadth throughout, obtuse ..... 1. *C. penduliflora.*
      - Calyx lobes glabrous, much longer than the corolla tube; stigmas elongated; corolla lobes tapering to the long-attenuate apex ..... 3. *C. panamensis.*

[1] 27: 24–29. 1907.

Corolla lobes ovate-triangular to orbicular, never with linear tips.
Calyx lobes broadly rounded at the apex, united for nearly half their length---------- 18. *C. scandens.*
Calyx lobes acute to attenuate, united only at the base.
Corolla lobes ovate to triangular, acute or acuminate.
Calvx shorter than the corolla tube; corolla 5 cm. long or more, yellow---------- 8. *C. lutea.*
Calyx longer than the corolla tube; corolla 4 cm. long or less, yellowish green.
Stems and calyx glabrous; leaflets acute, bright green---------- 6. *C. viorna.*
Stems densely villous about the nodes; calyx lobes villous-ciliate; leaflets obtuse, glaucescent---------- 7. *C. villosa.*
Corolla lobes suborbicular to rounded-ovate, rounded to obtuse at the apex.
Peduncles shorter than the leaves; leaflets 4 cm. long or less---------- 11. *C. minor.*
Peduncles longer than the leaves; leaflets usually 5 to 10 cm. long.
Lowest pair of leaflets much reduced, stipule-like---------- 17. *C. stipularis.*
Lowest pair of leaflets similar in size and form to the others.
Corolla 4 cm. long or less.
Calyx lobes half as long as the corolla, hirsute; leaflets obovate-oblong ---------- 10. *C. campanulata.*
Calyx lobes more than half as long as the corolla, glabrous; leaflets oblong---- 9. *C. triflora*
Corolla 5 to 7 cm. long. (Calyx lobes half as long as the corolla, or often much shorter.)
Lowest leaflets more or less auriculate, constricted above the base; calyx lobes glabrous.
Calyx lobes broadly oblong-ovate, 13 to 15 mm. wide; corolla 6 cm. long, the tube campanulate; peduncles solitary; leaflets acute or acuminate ---------- 15. *C. biaurita.*
Calyx lobes lanceolate or ovate-lanceolate, 8 to 11 mm. wide; corolla 7 cm. long, the tube obconic, tapering to the base; peduncles 2 together or 2-flowered; leaflets obtuse---------- 16. *C. pringlei.*

Lowest leaflets rounded to subcordate at the base, never auriculate, not constricted; calyx lobes pubescent.	
Calyx lobes more than half as long as the corolla tube, glabrous outside; leaflets oval to elliptic	12. *C. trianaei.*
Calyx lobes much less than half as long as the corolla tube, pubescent over all or nearly all the outer surface; leaflets narrowly oblong, narrowed toward the apex.	
Leaflets glabrous; calyx lobes sparsely puberulent	13. *C. pachysepala.*
Leaflets loosely villous beneath; calyx lobes densely tomentulose	14. *C. tomentulosa.*

1. Cobaea penduliflora (Karst.) Hook. f. Curtis's Bot. Mag. 95: *pl. 5757.* 1869, as to name only.

Rosenbergia penduliflora Karst. Fl. Columb. 1: 27. *pl. 14.* 1858.

TYPE LOCALITY: Caracas, Venezuela.

RANGE: Venezuela. Brand also reports[1] collections from Ecuador and Peru. Whether they really are of this species, or belong to *C. hookeriana*, or are undescribed, can not be determined without an examination of the specimens.

ILLUSTRATIONS: Brand in Engl. Pflanzenreich 27: *f. 8.*

No collections of this have been seen by the writer, but it is so well portrayed in Karsten's colored plate (copied by Brand) that there can be no doubt concerning its characteristics. In his description of this species, Brand contradicts his key to the two species which he refers to his section Rosenbergia. *Cobaea penduliflora* and *C. gracilis* are distinguished in the key by a single character, the former having "flores virides," and the latter "flores lutei." In the description of *Cobaea penduliflora*, however, the corolla is described as "viridi-rubescenti" and "sordide violaceis." The same author cites plate 5757 of the Botanical Magazine as representing this species, but his abbreviation of Karsten's description has not been so amended as to include the plant figured there.

2. Cobaea hookeriana Standley, sp. nov. PLATE 26.

Cobaea penduliflora Hook. f. Curtis's Bot. Mag. 95: *pl. 5757.* 1869, not *Rosenbergia penduliflora* Karst. 1858.

Stems slender, glabrous; leaves 7 to 12 cm. long, the leaflets oblong, 35 to 50 mm. long, pale green, thin, acute or acuminate, obtuse to subcordate at the base, conspicuously petiolulate; peduncles solitary, 20 to 25 cm. long, the flowers pendulous; calyx segments united only at the base, 35 to 40 mm. long, narrowly oblong, acute or acuminate, glabrous, green; corolla pale green, 10 to 12.5 cm. long, the tube 20 to 25 mm. long, campanulate, the lobes broadly linear, 4 to 5 mm. broad, of about the same length throughout, undulate, bifid at the apex, the sinuses between the lobes acute; stamens spreading, the filaments 7.5 cm.

[1] In Engl. Pflanzenreich 27: 28. 1907.

long, purplish red, villous at the base, the anthers yellow, 15 to 20 mm. long; style filiform, green, longer than the corolla, the stigmas slender, 1 cm. long; disk thick, 5-lobed, the lobes again 2-lobed; ovary 3-celled; fruit not known.

The type of this species is plate 5757 of Curtis's Botanical Magazine, the present description being drawn from the plate and from the accompanying description by Hooker. The plant figured was grown at Kew from seeds sent from Caracas, Venezuela, by Mr. A. Ernst. It flowered in the Palm House of the Royal Gardens in December, 1868. The same illustration is reproduced by Hemsley as a text figure in volume seventeen of The Garden, page 353.

As soon as one places Hooker's plate beside the excellent one of *Rosenbergia penduliflora* published by Karsten, it is obvious that two very different plants are represented. *Cobaea hookeriana* differs from Karsten's species in the less acute leaflets, longer, glabrous calyx lobes, larger corolla, broad, bifid, pale green corolla lobes, acute sinuses, short stamens, and elongated stigmas. The fact that both plants come from Venezuela means nothing, when one considers the number of species of the genus found in Guatemala. Although the seeds from which Hooker's plant were grown were sent from Caracas, they may have come from some locality far distant from that city.

As stated under *Cobaea penduliflora*, Brand cites the Botanical Magazine plate as that species, although his description excludes it. Hemsley[1] attempts to reconcile the differences between the two plates, apparently, stating that the length of the stamens and the color of the corolla is variable.

EXPLANATION OF PLATE 26.—Photograph of plate 5757 of Curtis's Botanical Magazine.

3. Cobaea panamensis Standley, sp. nov. PLATE 27.

Stems very slender, glabrous, purplish green; leaflets subequal, narrowly oblong to oblanceolate, 6 to 8 cm. long, 15 to 25 mm. wide, abruptly acute or acuminate, oblique and rounded to subcordate at the base, thin, glabrous, bright green, slightly paler beneath; petiolules 4 to 8 mm. long; peduncles solitary, pendulous, slender, 15 to 21 cm. long; calyx lobes united only at the base, glabrous, green, linear-lanceolate, 25 to 35 mm. long, long-attenuate; corolla deep brownish purple, the tube campanulate, 18 to 20 mm. long, with acute sinuses, puberulent outside, glabrous within, the lobes 6 cm. long, 5 or 6 mm. wide at the base, tapering to the long-attenuate tips; filaments very slender, purple, 9 to 11 cm. long, much exceeding the corolla, villous at the base; anthers purple, 1 cm. long; style slender, 10 to 13 cm. long, glabrous; stigmas slender, 8 mm. long; immature capsule elliptic, acute, glabrous.

Type in the U. S. National Herbarium, no. 677661, collected in sunny but cool places, between the Río Ladrillo and Los Siguas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, altitude 1,200 to 1,700 meters, March 18, 1911, by H. Pittier (no. 3270).

From the other species with much elongated and very narrow corolla lobes, this may be distinguished by the deep purple corolla with long-attenuate lobes. It is most closely related to *Cobaea penduliflora*, but differs in the narrower, long-attenuate, glabrous calyx lobes, acute sinuses of the corolla, and differently shaped leaflets.

EXPLANATION OF PLATE 27.—Part of type specimen. Scale ½.

4. Cobaea gracilis (Örst.) Hemsl. The Garden 17: 352. 1880. PLATE 28.

Rosenbergia gracilis Örst. Vid. Medd. Naturh. For. Kjøbenhavn 1856: 31. 1856.

TYPE LOCALITY: Naranjo, Costa Rica. Type collected by Örsted.

RANGE: Costa Rica and Panama.

ILLUSTRATIONS: Örst. Amér. Centr. *pl. 15.* 1863.

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[1] The Garden 17: 353. 1880.

COBAEA HOOKERIANA STANDLEY.

COBAEA PANAMENSIS STANDLEY.

COBAEA GRACILIS (ÖRST.) HEMSLEY.

The writer has seen no specimens of this species. Brand refers here a specimen collected by Polakowsky (no. 395) between Augusta and Zapoto, Province of Cartago, Costa Rica, and one collected by Warscewicz (no. 2, in part) in the province of Veraguas, Panama.

The calyx lobes are figured by Örsted as villous-ciliate, at least in part of the flowers illustrated, but this character is not mentioned in any of the descriptions.

EXPLANATION OF PLATE 28.—Photograph of plate 15 of L'Amérique Centrale, by A. S. Örsted. Scale ½.

5. Cobaea aschersoniana Brand, Helios **21**: 87. *f.* 2. 1904.

Rosenbergia aschersoniana House, Muhlenbergia **4**: 25. 1908.

TYPE LOCALITY: Forests of La Esmeralda, Volcán de Barba, Costa Rica. Type collected by Biolley (Pittier & Durand, no. 7178).

RANGE: Costa Rica.

ILLUSTRATIONS: Brand in Engl. Pflanzenreich **27**: *f.* 7A.

SPECIMENS EXAMINED:

COSTA RICA: Bordes du Rio Pedregoso au Copey, alt. 1,800 meters, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 12217). Forêts de la Esmeralda, Volcán de Barba, alt. 2,000 meters, *Biolley* (Inst. Fís. Geogr. Costa Rica, no. 7178). Bord des ruisseaux près de chalêts de Turrialba, alt. 2,500 meters, *Pittier* (Inst. Fís. Geogr. Costa Rica, no. 867).

Well distinguished by the densely villous calyx lobes and by the form of the corolla. Brand[1] made this the type of a new section of Cobaea, which he called "Aschersoniophila."

The fruit had not been seen by Brand. It may be described as follows: Capsule elliptic in outline, 5 cm. long, 2 cm. in diameter, acute, glabrous, glaucous; seeds 3 in each cell, 20 to 25 mm. long, 11 mm. wide, with very broad thin entire wings.

Brand[2] refers here a specimen collected by Warscewicz (no. 2, in part), no locality being stated. Since the remainder of this number came from Veraguas, Panama, it is probable that *Cobaea aschersoniana* also should be credited to Panama.

6. Cobaea viorna Standley, sp. nov.

Stems slender, glabrous, or sparingly puberulent about the nodes; petioles glabrous; leaflets thin, bright green, glabrous, similar and subequal, oval to oblong, 25 to 50 mm. long, 10 to 18 mm. wide, acute, mucronate, unequal and rounded or subcordate at the base, on petiolules 4 to 11 mm. long; peduncles solitary, 15 to 24 cm. long, much exceeding the leaves; calyx segments united only at the base, linear-oblong, 23 to 30 mm. long, 4 to 5.5 mm. wide, acute to abruptly acuminate, glabrous; corolla greenish yellow, 3.5 to 4 cm. long, the tube campanulate, sparingly puberulent outside, the lobes slightly shorter than the tube, ovate-triangular, acuminate, erect; filaments 35 to 55 mm. long, slender, villous at the base; anthers yellow, 1 cm. long; capsule oval in outline, 42 mm. long, 20 mm. wide, acute, glabrous, the cells each with 2 seeds.

Type in the U. S. National Herbarium, no. 256732, collected between Rodeo and Malacate, Guatemala, altitude 420 to 1,050 meters, January 20, 1895, by E. W. Nelson (no. 3745).

Most closely related to *Cobaea lutea*, but with smaller flowers, a greenish corolla, elongated peduncles, and longer calyx lobes. In general appearance the plant suggests some species of Viorna, this resemblance being due to the form of the buds, the appearance of the leaves, and the long peduncles.

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[1] Helios **21**: 88. 1904.

[2] In Engl. Pflanzenreich **27**: 28. 1907.

7. Cobaea villosa Standley, sp. nov.

Stems rather stout, striate or subangulate, densely villous about the nodes and sparingly so elsewhere; petioles and tendrils villous to puberulent; leaflets subequal, similar, obovate to oblong-obovate or oblong, 40 to 65 mm. long, 16 to 40 mm. wide, obtuse, mucronate, unequal and rounded or truncate at the base, thin, glaucescent, usually glabrous on the upper surface, sparingly puberulent beneath or glabrate, on petiolules 4 to 12 mm. long; peduncles solitary or 2 together, 13 to 19 cm. long, slender or stout, frequently flattened and usually coiled in age, puberulent or glabrous; calyx lobes united only at the base, 18 to 28 mm. long, 3 to 8 mm. wide, linear-oblong to lance-oblong, rather abruptly acuminate, conspicuously nerved, villous-ciliate; corolla yellowish green, 4 cm. long or slightly less, the tube campanulate, glabrous, the lobes about as long as the tube, ovate-triangular, acuminate, densely short-villous outside, glabrous within; filaments 8 cm. long or less, slender, villous at the base, the anthers yellow, 1 cm. long; capsule elliptic-oval, 4 cm. long, acute, glabrous, the cells 3 or 4-seeded; seeds irregularly oval or oblong, 18 to 21 mm. long, the wings very broad, finely reticulate-veined.

Type in the U. S. National Herbarium, no. 575607, collected in Salvador by Carlos Renson (no. 213).

ADDITIONAL SPECIMENS EXAMINED:

SALVADOR: San Salvador, *Velasco* (J. D. Smith, no. 8882).

From *Cobaea lutea* the present species differs in about the same respects as does *C. viorna*, besides having villous-ciliate instead of usually glabrous calyx lobes. From the latter species it differs in its villous stems, broader, obtuse, glaucescent leaflets, and villous-ciliate calyx segments.

8. Cobaea lutea Don, Edinburg Phil. Journ. 10: 112. 1824.

Cobaea macrostema Pav.; Don, loc. cit., as synonym; Hook. Curtis's Bot. Mag. 66: *pl. 3780.* 1840.

Cobaea acuminata DC.; Hook. loc. cit.

Cobaea macrostoma DC. Prodr. 9: 322. 1845.

Rosenbergia macrostoma House, Muhlenbergia 4: 24. 1908.

TYPE LOCALITY: Originally given as "Ad Portum Guayaquil in Regno Quitensi Peruvianorum," but Hooker states[1] that this locality was probably incorrect and that the type came perhaps from Mexico. If, however, the plant that has usually been given this name is correctly determined, the type probably came from Guatemala.

RANGE: Guatemala. Brand[2] also reports a specimen from Salvador, and credits the species to Costa Rica. It may have this range, but possibly these reports are the result of incorrect identifications.

SPECIMENS EXAMINED:

GUATEMALA: Laguna de Ayarza, Department of Jalapa, alt. 2,400 meters, *Heyde & Lux* (J. D. Smith, no. 3987). San Lucas, Department of Antigua, *C. & E. Seler* 2452. Between Guatemala City and Chiquimula, August 18, 1860, *Hayes*. Without locality, *Heyde* 240.

Well distinguished from the related species by the large corolla. The specimen figured by Hooker in the Botanical Magazine was grown at Kew from seeds sent from Guatemala by Skinner.

It is impossible to justify the use of the name *macrostema* (or any of its variations) for this species. Don plainly publishes the plant as *lutea*, citing Pavon's manuscript name *macrostema* as a synonym. Yet *lutea* has never been used by any other author to designate this species.

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[1] Loc. cit.

[2] In Engl. Pflanzenreich 27: 28. 1907.

9. Cobaea triflora Donn. Smith, Bot. Gaz. 13: 75. 1888.

Cobaea macrostoma triflora Brand in Engl. Pflanzenreich 27: 26. 1907.

Rosenbergia triflora House, Muhlenbergia 4: 25. 1908.

TYPE LOCALITY: Banks of the Rio Cajabón, near Cobán, Department of Alta Verapaz, Guatemala, at an altitude of 1,290 meters. Type collected by H. von Türckheim (no. 204).

RANGE: Known only from type collection.

SPECIMENS EXAMINED:

GUATEMALA: Type specimen.

The fruit, which has not been described, may be characterized as follows: Capsule elliptic or elliptic-oval in outline, about 43 mm. long and 18 mm. broad, acute, glabrous; seeds 2 or 3 in each cell, oval, 20 to 22 mm. long, 10 to 12 mm. wide, acute at the apex, deeply retuse at the base, the wings very broad, entire.

The transference of this species to rank as a subspecies of *Cobaea macrostoma* was unfortunate, since the two are not closely related. This is at once apparent upon comparing the original descriptions. Indeed, they are as distinct from each other as any other two species of the genus. The corolla lobes of *Cobaea triflora* are broadly rounded, while those of *C. lutea* (*macrostoma*) are acuminate. In the latter the stamens are long exserted, while in *C. triflora* they only slightly exceed the corolla. The only differences which Brand indicated between the two plants were the slightly different outline of the leaflets and the ternate rather than solitary arrangement of the peduncles of *triflora*. The flowers of this species seem to be more often solitary than in threes in the specimens seen by the writer, while in *Cobaea lutea* the peduncles are not always solitary.

Brand's error with regard to *Cobaea triflora* can be better understood after noting the specimens he cites under *Cobaea macrostoma triflora*. Three are enumerated. The first, collected in Guatemala by C. and E. Seler (no. 2293), the writer has not seen. The second is the type collection of *Cobaea triflora*. The third is Heyde and Lux's no. 3987, which is here referred to *Cobaea lutea*.

House,[1] in his treatment of Rosenbergia, refers to Brand's confusion of *Cobaea macrostoma* and *C. triflora;* but he himself does not clarify matters, for the only specimen which he cites under *triflora* is very different from Captain Smith's type and is evidently of the species here called *C. lutea*.

10. Cobaea campanulata Hemsl. The Garden 17: 352. 1880.

Rosenbergia campanulata House, Muhlenbergia 4: 24. 1908.

TYPE LOCALITY: Atacama, Chile. Type collected by Hinds.

RANGE: Known only from the type collection.

Hemsley describes the calyx segments as hirsute. The pubescence of the calyx in other species is villous and composed of jointed hairs. Probably it is not essentially different in the South American plant.

11. Cobaea minor Mart. & Gal. Bull. Acad. Sci. Brux. 12: 276. 1845.

Rosenbergia minor House, Muhlenbergia 4: 24. 1908.

TYPE LOCALITY: Mountain of Orizaba, Mexico, at 3,000 meters. Type collected by Galeotti (no. 1447).

RANGE: Southern Mexico to Costa Rica.

SPECIMENS EXAMINED:

MEXICO: Pié d' Orizaba, Vera Cruz, *Galeotti* 1447.

COSTA RICA: Volcán de Turrialba, Province of Cartago, alt. 2,400 meters, *Pittier* (Inst Fís. Geogr. Costa Rica, no. 13075; J. D. Smith, no. 7539).

[1] Muhlenbergia 4: 22. 1908.

As suggested by Hemsley, the foliage of this species somewhat resembles that of some of the vetches. The leaflets are much smaller than those of any other species. They are dark or dull green and glabrous above, but much paler and loosely villous beneath. The pubescence was not mentioned by Martens and Galeotti, and Brand describes the stems as glabrous. Our specimens, which are of the same and only collections cited by Brand, have numerous loose villous hairs on the stems, especially about the nodes, the pubescence being still more abundant on the petioles. The corolla is violet, according to Galeotti's label, although this was not mentioned in the original description. Brand describes the stamens as "longiuscule exserta," but in all the flowers examined by the writer they are well included. Martens and Galeotti state that the stigma is exserted, but they make no such statement concerning the stamens.

12. Cobaea trianaei Hemsl. The Garden 17: 353. 1880.

Rosenbergia trianaei House, Muhlenbergia 4: 24. 1908.

TYPE LOCALITY: Colombia. Brand cites a specimen collected in the Province of Bogotá at 2,300 meters by Triana (no. 2180). This may be the type collection, although Hemsley says the plant was collected in New Granada "without any special locality."

RANGE: Colombia.

ILLUSTRATIONS: Brand in Engl. Pflanzenreich 27: *f.* 7 *B*.

The writer has seen no specimens of this. Hemsley states that it was collected at Ibaque on the Quindiu by Purdie, at Antioquia by Jervise, and at Tolima de Nevado by Goudot.

13. Cobaea pachysepala Standley, sp. nov. PLATE 29.

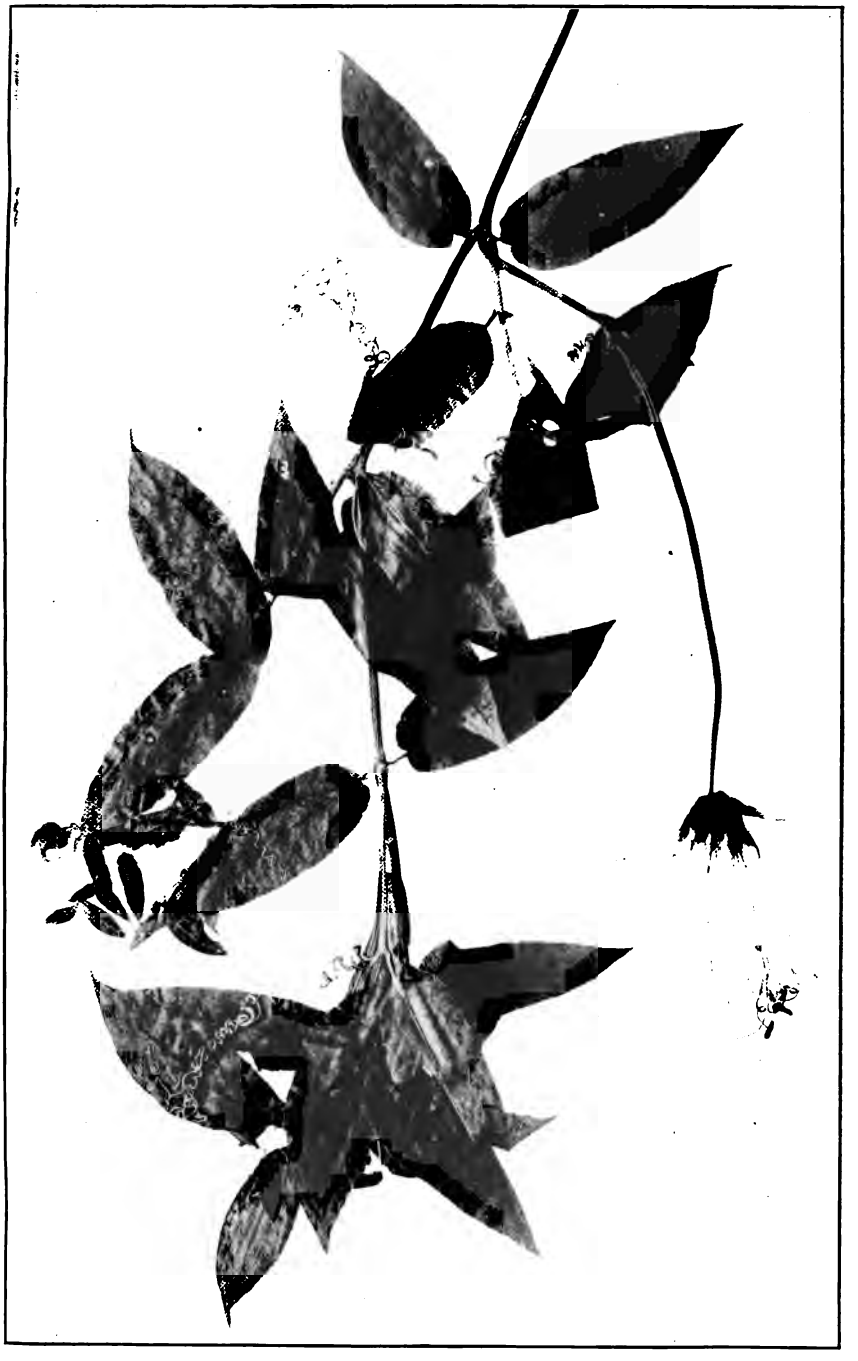
Stems stout, angulate or striate, glabrous except about the nodes, there sparsely villous; petioles glabrous or sparsely short-villous; leaflets equal, similar, 60 to 85 mm. long, 23 to 27 mm. wide, narrowly oblong, tapering from about two-thirds the distance above the base to an acuminate mucronate apex, rounded to subcordate at the base, dull green, slightly paler beneath, glabrous, or sparsely villous-ciliate when young; peduncles solitary, stout, straight in anthesis but curved or coiled in fruit, 12 to 18 cm. long; sepals united only at the base, lanceolate, 20 to 24 mm. long, rather abruptly attenuate, thick and leathery, puberulent outside near the base, finely tomentulose inside along the margins; corolla yellow, 5.5 to 6 cm. long, narrowed rather abruptly near the base, 4 to 4.5 cm. wide in the throat, finely and sparsely villous outside, the lobes short, 15 to 20 mm. long, rounded-ovate, obtuse, apparently erect; stamens about equaling the corolla, the filaments stout, villous near the apex, the anthers about 6 mm. long; style about 12 mm. longer than the corolla, the stigmas stout, 2.5 mm. long; capsule oblong-oval, 57 mm. long, 21 mm. broad, obtuse, glabrous; seeds numerous (about 8 or 9) in each cell, oblong-oval, about 2 cm. long, obtuse or rounded at the apex, subcordate at the base, broadly winged.

Type in the U. S. National Herbarium, no. 399435, collected on the Volcán de Agua, Department of Sacatepequez, Guatemala, February 15, 1905, by W. A. Kellerman (no. 4395).

ADDITIONAL SPECIMENS EXAMINED:

GUATEMALA: Volcán de Agua, alt. 2,700 to 3,000 meters, *Maxon & Hay* 3747.

It is difficult to tell with which of the previously described species this should be compared, for it is not very closely related to any of them. Perhaps it is nearest *Cobaea triflora*, but it differs widely in the size and form of the leaflets, as well as in the numerous seeds. The leaflets are different from those of any



COBAEA PACHYSEPALA STANDLEY.

COBAEA BIAURITA STANDLEY.

other species except *C. tomentulosa*, being of nearly uniform width for two-thirds their length, then tapering to the apex.

EXPLANATION OF PLATE 29.—Specimen of *Cobaea pachysepala, Mason & Hay* 3747. Scale ½.

14. Cobaea tomentulosa Standley, sp. nov.

Stems stout, obscurely tomentulose except about the nodes, there tomentose; petioles stout, abundantly tomentulose; leaflets narrowly oblong to lance-oblong or elliptic, 5 to 9 cm. long, 25 to 30 mm. wide, acute, mucronate, rounded or subcordate at the base, dull green, sparsely puberulent on the upper surface, loosely villous beneath with rather short hairs, on petiolules 7 to 14 mm. long; peduncles stout, solitary, 22 to 24 cm. long, at first straight and erect, curved or coiled in age, sparsely puberulent; calyx segments united only at the base, 20 to 25 mm. long, lanceolate to narrowly oblong, acuminate, thick, densely tomentulose outside and along the margins within; corolla 55 to 60 mm. long, truncately obconic, villous outside, glabrous within, yellow, the lobes about half as long as the tube, rounded-ovate, obtuse; stamens only slightly surpassing the corolla, the filaments villous, densely so at the base, the anthers yellow, 8 mm. long; style slightly exserted, the stigmas thick, 3 mm. long; capsule oblong-elliptic, 55 mm. long, acutish, glabrous; seeds 4 to 6 in each cell, about 2 cm. long.

Type in the U. S. National Herbarium, no. 250869, collected near Zunil, Guatemala, altitude 2,340 to 2,400 meters, January 20, 1896, by E. W. Nelson (no. 3683).

Similar in general form to the preceding species, but distinguished by the densely tomentulose calyx and the villous leaflets of slightly different outline on longer petiolules.

15. Cobaea biaurita Standley, sp. nov. PLATE 30.

Stems slender, glabrous; leaflets glabrous, green, slightly paler beneath, rather abruptly acute or acuminate, mucronate, the lowest pair subsessile, elliptic or narrowly oval, constricted above the base, with 2 rounded unequal basal auricles, the upper leaflets oval, unequal and rounded to acutish at the base, on petiolules 5 to 7 mm. long; peduncles stout, solitary, about 20 cm. long; calyx lobes united for only a short distance at the base, broadly oblong-ovate, about 3 cm. long, 13 to 15 mm. wide, rather abruptly narrowed to a triangular-subulate tip, green, glabrous outside, densely puberulent within; corolla 6 cm. long, 2.5 cm. wide above the base, sparsely villous-puberulent outside, the lobes less than half as long as the tube, broadly rounded; stamens slightly exserted, the anthers about 8 mm. long; style exserted about 2 cm., the stigmas stout, 2 mm. long; fruit not seen.

Type in the U. S. National Herbarium, no. 233329, collected near Tumbala, Chiapas, Mexico, altitude 1,200 to 1,650 meters, October 20, 1895, by E. W. Nelson (no. 3363).

Nearest *Cobaea scandens*, but distinguished by the green foliage, differently shaped leaflets, and very different calyx lobes, which are united for only a short distance at the base. In *C. scandens* the calyx segments are broadly rounded at the apex and mucronate. The plant is said to be a vine 4.5 to 6 meters high, with greenish flowers.

EXPLANATION OF PLATE 30.—Type specimen. Scale ½.

16. Cobaea pringlei (House) Standley. PLATE 31.

Rosenbergia pringlei House, Muhlenbergia 4: 24. 1908.

TYPE LOCALITY: In the Sierra Madre near Monterey, State of Nuevo Leon, Mexico. Type collected by Pringle (no. 11901), August 29, 1903.

RANGE: Known only from type collection.

SPECIMENS EXAMINED:

MEXICO: Type collection.

This comes from a locality far north of those reported for other members of the genus. It is related to the last preceding species; but the corolla is larger, the calyx lobes of very different form, and the leaflets obtuse (rather than acute or acuminate) and glaucescent.

EXPLANATION OF PLATE 31.—Specimen of type collection in the U. S. National Herbarium. Scale ½.

17. Cobaea stipularis Benth. Pl. Hartw. 45. 1840.

Rosenbergia stipularis House, Muhlenbergia 4: 23. 1908.

TYPE LOCALITY: Near San Cornelio, State of Hidalgo, Mexico. Type collected by Hartweg (no. 344).

RANGE: Southern Mexico.

ILLUSTRATIONS: Edwards's Bot. Reg. 27: *pl. 25.*

The only specimen the writer has seen is one in the U. S. National Herbarium, grown in the Royal Botanical Garden at St. Petersburg. This has no open flowers, but the form of the leaves is exactly that described and figured for *Cobaea stipularis.* The species is readily distinguished by having the lowest pair of leaflets reduced and stipule-like. Brand[1] reports a specimen from Guayaquil, but it is very doubtful whether it is correctly determined. Hemsley[2] refers here Coulter's 928 from Zimapan, Mexico, while House cites Mueller's no. 634 from Orizaba.

18. Cobaea scandens Cav. Icon. Pl. 1: 11. *pl. 16, 17.* 1791.

Rosenbergia scandens House, Muhlenbergia 4: 23. 1908.

TYPE LOCALITY: Described from plants cultivated at Madrid, grown from seeds said to have come from near the City of Mexico.

RANGE: Southern Mexico.

ILLUSTRATIONS: Curtis's Bot. Mag. 21: *pl. 851;* Fl. Serr. Jard. 14: *pl. 1467;* Engl. & Prantl, Pflanzenfam. 4[3a]: *f. 19;* Lubbock, Contr. Knowl. Seedl. 2: *f. 529;* Engl. Pflanzenreich 27: *f. 6.*

SPECIMENS EXAMINED:

MEXICO: Orizaba, *Botteri* 294. Environs de Puebla, October 10, 1909, *Nicolas.*

The plant is not uncommon in cultivation, having been introduced into Europe as early as 1787. Most of the seedsmen of the United States offer the seeds. A form with variegated leaves is known, this being the one illustrated in the Flore des Serres.

This species is readily distinguished from all the others by the very broad, rounded calyx lobes which are united nearly to the middle. According to Brand[1] it has escaped from cultivation in Brazil.

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[1] In Engl. Pflanzenreich 27: 26. 1907.

[2] The Garden 17: 352. 1880.

COBAEA PRINGLEI (HOUSE) STANDLEY.

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[Synonyms in italic. Page numbers of principal entries in heavy-face type.]

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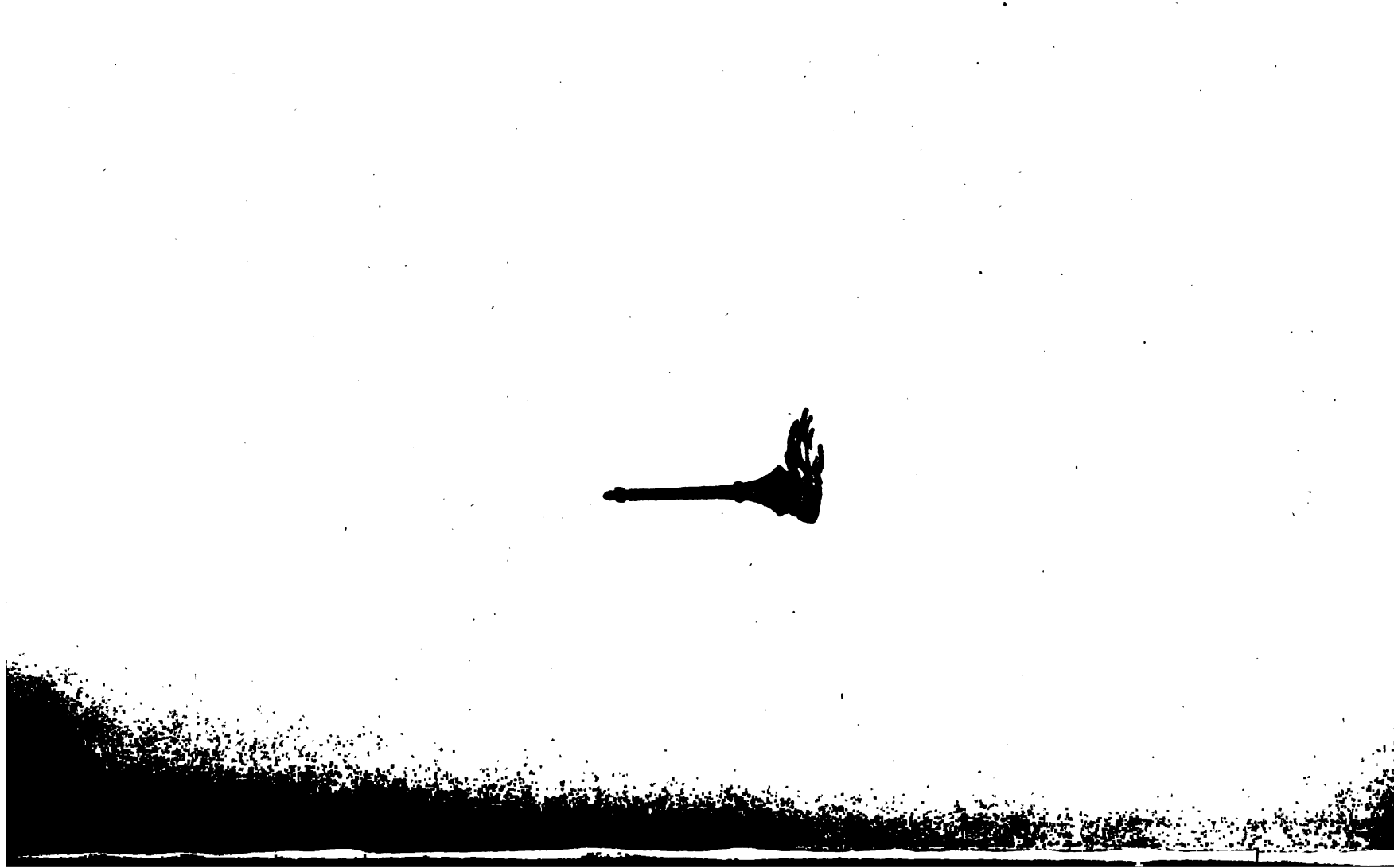

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II

PREFACE.

There is presented herewith a second installment of studies by Mr. Paul C. Standley, of the United States National Herbarium, upon the flowering plants of tropical America. The new species described and the changes of nomenclature proposed are largely the result of work upon certain groups, chiefly Rubiaceae, Malvaceae, and Leguminosae, as represented in the extensive collections obtained recently in Panama during the progress of the Smithsonian Biological Survey of the Panama Canal Zone. A large part of the paper consists of descriptions and nomenclatorial changes in the Amaranthaceae and Allioniaceae incidental to monographic work upon these families. Two new genera are proposed in the Malvaceae.

FREDERICK V. COVILLE,
Curator of the United States National Herbarium.

CONTENTS.

STUDIES OF TROPICAL AMERICAN PHANEROGAMS—NO. 2.

By PAUL C. STANDLEY.

INTRODUCTION.

The present paper is in continuation of a series begun in 1914.[1] It contains descriptions of new species and taxonomic notes upon various groups of plants, but chiefly the Amaranthaceae, Allioniaceae, Malvaceae, and Rubiaceae, and the group of families formerly known as the Leguminosae. There are included descriptions of two new genera in the Malvaceae.

The new species described are based chiefly upon the extensive collections obtained in Panama by Mr. H. Pittier. Study of the Panama collections shows very clearly the close alliance of the flora of the Isthmus with that of Colombia, as was to be expected. Quite unforeseen, however, is its inclusion of certain genera which are characteristically Brazilian, a fact recently pointed out by Mr. Pittier.[2] Two Brazilian genera, Cassupa and Stachyarrhena, are here reported for the first time from North America. Moreover, several of the species described as new have their closest allies in Brazilian plants.

NEW CYPERACEAE FROM PANAMA.

While working with the Cyperaceae of Panama, the writer discovered two apparently undescribed species, a Rynchospora and a Scleria, descriptions of which are published below. The Rynchospora is particularly interesting, being very unlike any species previously reported from North America.

There are also included new combinations in Cyperus, Stenophyllus, and Calyptrocarya, which are necessary for properly listing the Panama Cyperaceae.

Rynchospora argentea Standley, sp. nov.

Tufted perennial; leaves 30 to 40 cm. long, 2 to 3 cm. wide, acuminate, narrowed at the base into broadly winged petioles, prominently nerved, scabrous on the margins, elsewhere glabrous, silvery white, especially on the upper surface, at least when dry;

[1] Contr. U. S. Nat. Herb. 17: 427–458. *pls. 24–31.* 1914.

[2] Journ. Washington Acad. Sci. 5: 468–469. 1915.

inflorescence 20 cm. long or less, much shorter than the leaves, nearly naked, bearing only 1 or 2 much reduced thin pale leaves, paniculate but only sparingly branched, the branches angled, glabrous; spikelets solitary, on peduncles 1.5 to 3 mm. long; empty scales several, nearly white, hyaline, lanceolate or oblong, acute, with short subulate tips, glabrous except for the scaberulous midnerve; bristles of the involucre 6, white, scaberulous; style branches very short; fruit not seen.

Type in the U. S. National Herbarium, no. 679431, collected on high hills back of Puerto Obaldía, on the San Blas Coast, Panama, August, 1911, by H. Pittier (no. 4307).

In general appearance this is very unlike any other species of which material or descriptions have been seen. Its broad, elongated, silvery leaves and the very short inflorescence, nearly leafless and bearing but few spikelets, will enable one to recognize it readily.

Scleria hitchcockii Standley, sp. nov.

Underground parts not seen; plants slender, about 70 cm. high, rather sparingly leafy; culms triquetrous, sharply angled, striate, yellowish green, obscurely scaberulous; sheaths closely investing the culms and nearly covering them, 3 to 5 cm. long, sharply angled, striate, glabrous, or hirsutulous near the summit; ligule very short, about 1 mm. long, truncate, hirsute; leaf blades 12 to 18 cm. long, narrow, 2 to 4 mm. wide, yellowish green, acute, conspicuously nerved, nearly glabrous, but often hirsute-ciliate on the margins and on the midvein beneath; inflorescence much exserted, on a slender peduncle; panicle about 11 cm. long, composed of few very slender spikes, the branches short-ciliate on the angles; bract subtending the inflorescence 3.5 cm. long, very narrow; spikelets in sessile fascicles of 2, each consisting of one fertile and one sterile flower; glumes of the fertile flower about 2 mm. long, reddish brown, ovate, oblong-ovate, or lanceolate, thin, strongly keeled, the midnerve extended as a short awn; glumes of the sterile flowers slightly longer, about 3 mm. long, narrower; achenes smooth and shining, white, spherical or depressed, 1.2 mm. in diameter, disk fused with the achenes as a short thick stipe.

Type in the U. S. National Herbarium, no. 678393, collected on a grassy hillside in the foothills near El Boquete, Province of Chiriquí, Panama, altitude 1,000 to 1,300 meters, September 28 to October 7, 1911, by A. S. Hitchcock (no. 8326).

The proposed species is related to *Scleria lithosperma*, but differs conspicuously in the slender branches, short scales of the flowers, and small, depressed achenes.

Calyptrocarya glomerulata (Brongn.) Standley.
Becquerelia glomerulata Brongn. in Duperrey, Bot. Voy. Coquille **2**: 163. 1829.
Calyptrocarya fragifera Kunth, Enum. Pl. **2**: 364. 1837.
Tropical America.

Cyperus hermaphroditus (Jacq.) Standley.
Carex hermaphrodita Jacq. Coll. Bot. **4**: 174. 1790.
Mariscus jacquinii H. B. K. Nov. Gen. & Sp. **1**: 216. 1815.
West Indies and Mexico to Argentina.

Stenophyllus paradoxus (Spreng.) Standley.
Schoenus paradoxus Spreng. Syst. Veg. **1**: 190. 1825.
Bulbostylis paradoxa Kunth, Enum. Pl. **2**: 206. 1837.
Central America and tropical South America.

NEW AMARANTHACEAE FROM TROPICAL NORTH AMERICA.

Recently the writer has been engaged in monographing the family Amaranthaceae for the North American Flora. In a group to which so little attention had been given it was to be expected that more

than a few new species would be discovered. Some of these have been published during the past year.[1] A considerable number of others, chiefly in the genera Iresine and Achyranthes, are described in the present paper. The name Achyranthes is here used for the genus generally known as Alternanthera. The reasons for the use of the name in this sense the writer has recently explained at length.[2] He has also published a synoptic account of the North American representatives of the family.[3]

Achyranthes panamensis Standley, sp. nov.

Stems weak and probably clambering over shrubs, herbaceous, much branched, the branches slender, angulate, short-pilose with solitary or fasciculate, spreading or reflexed hairs; petioles 1 to 4 mm. long; leaf blades oblong-elliptic or ovate-oblong, 2 to 5.5 cm. long, 0.6 to 2 cm. wide, acute or acuminate, acutish at the base, firm, bright green, appressed-pilose on both surfaces with short slender fulvous hairs; peduncles axillary and terminal, simple or usually branched, 1 to 6 cm. long, slender, densely short-pilose; spikes usually solitary, globose-ovoid or short-cylindric, 8 to 11 mm. long, 7 mm. thick; bracts broadly ovate, acuminate, glabrous; bractlets broadly ovate, half as long as the sepals, aristate-acuminate, sparsely short-villous; sepals lance-oblong, 2.5 mm. long, acute or acutish, 3-nerved, purplish (brownish or fuscous when dry), glabrous; filaments short, linear-subulate; staminodia equaling or exceeding the anthers, two-thirds as long as the sepals or shorter, lacerate at the apex; style short, the stigma entire; seed subglobose, 1 mm. long, black and shining.

Type in the Herbarium of Columbia College (New York Botanical Garden), collected in Panama by Sutton Hayes (no. 944).

In floral characters this plant is similar to *Achyranthes mexicana* (Schlecht. & Cham.) Standley, but in that species the slender peduncles are simple and the flowers are white or slightly stramineous.

Achyranthes williamsii Standley, sp. nov.

Stems herbaceous, clambering over shrubs and herbs, sparsely branched, the branches stout, striate, cinereous-puberulent; petioles stout, 2 to 10 mm. long; leaf blades oblong, ovate-oblong, or rarely elliptic, 2.5 to 8 cm. long, 8 to 33 mm. wide, acute, acutish, or obtuse at the apex, acute or obtuse at the base, pubescent on both surfaces with very short, lightly appressed hairs, bright green, rather thick; peduncles axillary, simple or rarely branched, 2 to 6 cm. long, stout, cinereous or glabrate; heads solitary, short-cylindric or ovoid, 1 to 3 cm. long, 10 to 12 mm. thick; bracts broadly ovate, acuminate, glabrous; bractlets half as long as the sepals, ovate, aristate-acuminate, short-pilose; sepals narrowly lance-oblong, 5 mm. long, acuminate, whitish or stramineous, 3-nerved, short-pilose, the tips slightly spreading; filaments very short, the staminodia ligulate, longer than the anthers and slightly shorter than the sepals, lacerate at the apex; style evident, the stigma entire.

Type in the U. S. National Herbarium, no. 678206, collected near Citura, Panama, April 14, 1908, by R. S. Williams (no. 675).

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[1] Standley, Paul C. New or notable species of Amaranthus. Bull. Torrey Club 41: 505–510. 1914. A new species of Achyranthes from Tobago. Proc. Biol. Soc. Washington 28: 87. 1915.

[2] The application of the generic name Achyranthes. Journ. Washington Acad. Sci. 5: 72–76. 1915.

[3] The North American tribes and genera of Amaranthaceae. Journ. Washington Acad. Sci. 5: 391–396. 1915.

ADDITIONAL SPECIMENS EXAMINED:

PANAMA: Ancón, April 20, 1911, *Mrs. G. N. McMillan* (Herb. Gray). Without locality, *Seemann* (Herb. Gray). Ahorca Lagarto, 1905, *Cowell* 255 (Herb. N. Y.).

NICARAGUA: San Juan del Sur, *Torrey* (Herb. Gray). Island Ometepe, Lake Nicaragua, January, 1893, *C. L. Smith* (Herb. Gray).

This plant has no very close relatives among the previously described species reported from Central America, unless it may be *Achyranthes pycnantha* (Benth.) Standley. In that the sepals are densely long-pilose and 6 to 7 mm. long, the leaves are nearly glabrous, and the peduncles are usually branched.

Achyranthes stenophylla Standley, sp. nov.

Stems slender, branched, the branches ascending or suberect, striate, very sparsely pilose or glabrate; leaves numerous, the internodes short, the petioles 2 to 10 mm. long; leaf blades linear to elliptic-linear, 2.5 to 5 cm. long, 3 to 6 mm. wide, acute or acutish, acuminate at the base, very sparsely appressed-pilose or glabrate; peduncles axillary, simple, 2 to 5 cm. long, short-pilose, very slender; spikes ovoid or short-cylindric, 6 to 10 mm. long, 6 mm. thick; bracts broadly ovate, acute, glabrous; bractlets half as long as the sepals, acuminate, long-aristate, sparsely short-villous; sepals lance-oblong, 2.5 mm. long, acute or acutish, membranaceous, 3-nerved, sparsely short-pilose, stramineous, the tips erect or slightly incurved; filaments short, the staminodia ligulate, longer than the anthers, two-thirds as long as the sepals, lacerate at the apex; style evident, the stigma entire.

Type in the Herbarium of Columbia College (New York Botanical Garden), collected in Panama by Sutton Hayes (no. 941).

This plant belongs to the same group as *A. pycnantha*, *A. williamsii*, and *A. cordobensis*, but it is very distinct from all of them in its smaller spikes and very narrow leaves.

Achyranthes laguroides Standley, sp. nov.

Erect or ascending, suffruticose below, the stems 1 meter long or less, much branched, the branches striate, sparsely pilose-strigose or glabrate; leaves very shortly petiolate, the blades narrowly lanceolate to elliptic-linear, 1.5 to 5.5 cm. long, 2 to 6 mm. wide, acuminate or attenuate at both ends, pilose-sericeous, densely so beneath; peduncles simple or branched, 5 to 20 mm. long, or the heads often sessile or subsessile, the peduncles densely pilose-sericeous; spikes ovoid or short-cylindric, 1 to 2 cm. long, 9 mm. thick, the flowers whitish-stramineous; bracts and bractlets ovate-triangular, half as long as the sepals, acuminate or long-acuminate, sparsely pilose or glabrate; sepals linear-oblong, 4 to 5 mm. long, acuminate, membranaceous, 1-nerved, pilose near the base with straight erect jointed white hairs, these equaling or slightly exceeding the sepals; stamen tube elongate, the antheriferous lobes short; staminodia ligulate, exceeding the anthers, deeply and acutely laciniate at the apex; style elongate.

Type in the U. S. National Herbarium, no. 471849, collected near San Francisco de Guadalupe, Costa Rica, May, 1893, by A. Tonduz (Inst. Fís. Geogr. Costa Rica no. 8006). There is a specimen of the same plant in the herbarium of the Missouri Botanical Garden, collected somewhere in Costa Rica in April, 1910, by G. C. Worthen.

The species is a very distinct one. It is to be placed nearest *Achyranthes stenophylla*, but that has flowers only half as large and sparsely short-pilose sepals.

Achyranthes cordobensis Standley, sp. nov.

Plants much branched, the branches spreading, loosely short-pilose, or glabrate in age; petioles 1 to 3 mm. long; leaf blades ovate-oblong or oval, or the uppermost lance-oblong, 3 to 6 cm. long, 8 to 20 mm. wide, rather abruptly long-acuminate, obtuse at the base, thin, densely pilose-sericeous beneath, less densely so on the upper surface; peduncles simple, axillary, 2 to 6 cm. long, pilose with ascending hairs; spikes solitary, rarely sessile, ovoid or short-cylindric, 8 to 15 mm. long, 11 mm. thick;

bracts and bractlets half as long as the sepals, broadly ovate, aristate-acuminate, subscarious, stramineous; sepals lance-oblong, 5 mm. long, acutish, subcartilaginous in age, 3-nerved, stramineous, sparsely short-pilose, the tips slightly spreading; stamen tube short; staminodia much exceeding the anthers, less than half as long as the sepals, ligulate, deeply fimbriate at the apex; style evident, the stigma entire.

Type in the U. S. National Herbarium, no. 125547, collected in the Valley of Córdoba, Mexico, February 11, 1866, by Bourgeau (no. 1946).

Related to *A. williamsii*, described above, but differing in the long-acuminate or abruptly acuminate leaves, which are densely pilose-sericeous beneath, and in the merely acutish, rather than acuminate, sepals.

Gomphrena dispersa Standley, sp. nov.

Gomphrena decumbens Moq. in DC. Prodr. 13²: 410. 1849, in part, not *G. decumbens* Jacq.

Gomphrena decumbens genuina Stuchlík, Repert. Nov. Sp. Fedde 11: 156. 1912, in part, not *G. decumbens* Jacq.

Gomphrena decumbens grandifolia Stuchlík, Repert. Nov. Sp. Fedde 11: 157. 1912, in part.

Prostrate or procumbent annual or perennial, much branched, the branches 20 to 100 cm. long, slender, sparsely or densely appressed-pilose; leaves numerous, short-petiolate, the blades oval-obovate to oblong, 1.5 to 5 cm. long, 5 to 20 mm. wide, obtuse to rounded at the apex, mucronate, acuminate to attenuate at the base, bright green, pilose-sericeous, often glabrate on the upper surface; spikes usually solitary, terminal or axillary, subglobose or short-cylindric, 9 to 13 mm. in diameter, each subtended by 2 acute sessile leaves, these usually shorter than the spikes; bracts rounded-ovate, acuminate, white, often denticulate; bractlets 5 to 6 mm. long, about 3 times as long as the bracts, thin, acute to obtuse, white or rarely purplish red, narrowly cristate at the apex, the crest extending along the keel for only a short distance, denticulate or laciniate; perianth usually equaling the bractlets, densely lanate, the lobes oblong-linear, acuminate or attenuate, white; stamen tube commonly included; style elongate, the stigmas slender; seed 1.5 mm. long, reddish brown, shining.

Type in the U. S. National Herbarium, no. 698287, collected at the edge of a cultivated field, Sierra de Anafe, Pinar del Río, Cuba, December 21, 1911, by Percy Wilson and Brother León (no. 11485).

ADDITIONAL SPECIMENS EXAMINED:

FLORIDA: Waste ground, near Tampa, 1913, *Tidestrom* 7005. Without locality, *Rugel* 98.

MEXICO: Guadalajara, Jalisco, 1886, *Palmer* 238. Atlixco, Puebla, 1893, *Nelson*. Valley of Oaxaca, 1894, *Nelson* 1307. Corral de las Piedras, vicinity of Zacuapan, Veracruz, 1906, *Purpus* 2284. Yucatán, *Gaumer* 369 pt. Vicinity of Mérida, Yucatán, 1912, *Collins* 11.

GUATEMALA: Escuintla, 1890, *J. D. Smith* 1977. Livingston, 1905, *von Türckheim* (J. D. Smith, no. 8738). Morán, Depart. Amatitlán, *Kellerman* 4840.

NICARAGUA: *C. Wright*.

EL SALVADOR: *Renson* 154.

COSTA RICA: Hacienda Babilonia, *Tonduz* 215. Río Hondo, Plains of Santa Clara, 1903, *Cook & Doyle* 596. Nicoya, 1900, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 13701).

CUBA: Herradura, 1907, *Earle* 766. Vicinity of La Gloria, Camaguey, 1909, *Shafer* 63. San Luis, Province of Pinar del Río, 1911, *Britton, Britton & Cowell* 9738. Isle of Pines, 1904, *Curtiss* 410; 1901, *A. A. Taylor* 88; 1900, *Palmer & Riley* 1117. Pinar del Río, 1900, *Palmer & Riley* 45. Camaguey to Santayana, 1909, *Britton* 2350.

JAMAICA: Up Park Camp, 1912, *Harris* 11542.

PORTO RICO: Santurce, 1913, *Chase* 6345½.

The specimens cited above are only a part of those examined by the writer. The species appears to be very abundant in the Greater Antilles and along the eastern coast of Central America, occurring chiefly as a weed in waste or cultivated ground. It has always been confused with *Gomphrena decumbens* Jacq., described in 1804. It is remarkable that a plant so common in the West Indies has never received a name, but apparently no one has ever questioned its identity with Jacquin's species.

Gomphrena decumbens was described[1] from cultivated specimens whose origin was not known. The description is ample and fortunately is accompanied by an excellent plate. There is no doubt that it applies to a plant which is common from eastern and central Mexico to Guatemala and is found also in South America. So far as the writer knows, it does not occur in the West Indies. It differs from *Gomphrena dispersa* in having the crests of the bractlets widest much below the apex, if they are perceptibly widest anywhere, the flowers thus appearing pointed or acuminate. Moreover, the bractlets are much longer than the flowers, while in *G. dispersa* they equal or are shorter than the perianth. In the latter species the crests are widest at or near the apex of the bractlets, and the flowers thus appear obtuse or merely acutish. In *Gomphrena decumbens*, furthermore, the flowers are very frequently tinged with red, or are yellowish, while in the proposed new species they are a dull, clear white. It is very probable that *G. dispersa* is to be found also in northern South America, but so far no specimens have been seen nor do any of the descriptions of species from that region appear to apply to it.

Gomphrena parviceps Standley, sp. nov.

Gomphrena decumbens pringlei Stuchlík, Repert. Nov. Sp. Fedde 11: 156. 1912, in part, not *G. pringlei* Coult. & Fish. 1892.

Prostrate or procumbent annual, much branched, the stems 10 to 30 cm. long, slender or stout, often tinged with red, appressed-pilose; leaves numerous, subsessile, the blades oblong or spatulate, 1 to 3.5 cm. long, 4 to 10 mm. wide, rounded or obtuse at the apex, acutish at the base, green, appressed-pilose beneath, glabrate above; spikes solitary or glomerate, terminal or axillary, subglobose, 7 mm. in diameter, each spike or cluster of spikes subtended by 2 or several sessile leaves, these usually 2 to 3 times as long as the spikes; bracts broadly ovate, acuminate; bractlets 3 mm. long, scarious, white, tinged with pink, twice as long as the bracts, narrowly cristate at the apex, the crest obscurely denticulate, pink or white; perianth conspicuously exceeding the bractlets, the lobes oblong, obtuse, truncate, or emarginate at the apex, the outer ones subcoriaceous, white or pink, glabrous, the inner ones thin, bright green except along the margin, very sparsely lanate; stamen tube about equaling the perianth; style elongate, the stigmas filiform; seed ovoid, 1.5 mm. long, reddish brown.

Type in the U. S. National Herbarium, no. 354471, collected in the Valley of Mexico, Federal District, Mexico, altitude 2,190 meters, October 3, 1899, by C. G. Pringle (no. 8251).

Related to *Gomphrena pringlei* Coult. & Fish., but in that species the calyx lobes are acute and the perianth merely equals the bractlets instead of exceeding them.

Gossypianthus brittonii Standley, sp. nov.

Caudex much branched both above and below the surface of the soil, the branches stout or slender; stems numerous, prostrate, 4 to 9 cm. long, slender, lanate when young but soon glabrate; basal leaves petiolate, the blades oblanceolate, 6 to 8 mm. long, 1.5 to 2 mm. wide, obtuse or acutish, pilose above, pilose-sericeous beneath; cauline leaves short-petiolate, the blades orbicular to oval, 2 to 4 mm. long, obtuse or rounded at the apex, glabrate above, pilose beneath; flowers glomerate, the glomer-

[1] Jacq. Pl. Hort. Schönbr. 4: 41. *pl.* 482. 1804.

ules much longer than the subtending leaves; bracts ovate to orbicular-ovate, nearly equaling the sepals, obtuse or rounded at the apex, white, scarious, glabrous; sepals 2.5 to 3 mm. long, lance-oblong, acute, faintly 3-nerved, green along the nerves, the margins white and scarious; filaments linear, dilated at the base; utricle oval; seed oval, 1.2 mm. long, brown, shining.

Type in the herbarium of the New York Botanical Garden, collected on a rocky hill in a palm barren, Santa Clara, Cuba, April, 1912, by N. L. Britton and J. F. Cowell (no. 13318).

Apparently there are two species of Gossypianthus in the West Indies. One of these, *G. lanuginosus*, was described from Santo Domingo, and is known also from Mexico and Texas. In the Bernhardi Herbarium (Herb. Mo. Bot. Gard.) there is a specimen from Santo Domingo, labeled *Achyranthes piloselloides* Poit., which agrees in all respects with the common Texan plant. The Cuban Gossypianthus is apparently distinct in having obtuse rather than acute or acuminate bracts and bractlets, a much branched caudex, and much smaller leaves.

Iresine acicularis Standley, sp. nov.

Stems erect, stout, very sparsely pubescent with short slender hairs, the internodes 10 to 23 cm. long; petioles slender, 1 to 5.5 cm. long; leaf blades ovate or broadly ovate, 6.5 to 20 cm. long, 3.5 to 10 cm. wide, or those within the inflorescence somewhat smaller, rather abruptly long-attenuate or acute, rounded or obtuse at the base and abruptly short-decurrent, thin, bright green, very sparsely villous on the upper surface with short remote soft yellowish white hairs, similarly pubescent beneath and furnished in addition with numerous appressed shining amber-colored or bright yellow acicular hairs, villous-ciliate, rather prominently veined, but the veins slender, diverging at angles of from 50 to 70 degrees; inflorescence a broad, dense, somewhat leafy panicle, 25 cm. long and 15 cm. broad, the rachises sparsely villous and bearing in addition numerous stout, acicular, glistening amber-colored or yellow hairs, these most abundant at the base of the spikelets; spikelets alternate, pediceled or sessile, densely flowered, stout, 4 to 12 mm. long; bracts white, rounded-ovate to narrowly ovate, acute, from half as long to fully as long as the sepals; sepals about 1.5 mm. long, narrowly oblong, acute, those of the pistillate flowers 3-nerved, the flowers furnished at the base with copious long white wool; staminal cup not lobed; utricle shorter than the sepals; seed suborbicular, 0.5 mm. in diameter, dark reddish brown, shining.

Type in the U. S. National Herbarium, no. 399603, collected on the Volcán de Fuego, Department of Sacatepequez, Guatemala, at an altitude of 2,700 meters, February 20, 1905, by W. A. Kellerman (no. 4549).

ADDITIONAL SPECIMENS EXAMINED:

GUATEMALA: Near the Finca Sepacuité, 1902, *Cook & Griggs* 214.

COSTA RICA: Chirripó Farm, 1900, *Pittier* 16078.

The proposed species is related to *Iresine celosioides* L., but is distinguished by the dentate bracts, and more strongly by the peculiar pubescence of the inflorescence. No other species of the genus is known to have trichomes of the same form.

Iresine arenaria Standley, sp. nov.

Erect perennial, suffrutescent at the base, much branched, the branches slender, erect-ascending, green, striate, glabrous; petioles slender, 4 to 5 mm. long; leaf blades linear to narrowly ovate, 2.5 to 4.5 cm. long, 2 to 12 mm. wide, acute or acuminate, obtuse to acuminate at the base, rather thick, deep green, glabrous; flowers polygamous, narrowly paniculate, the panicles open or congested, nearly naked, 4 to 20 cm. long, the branches slender or stout, ascending, short, the spikelets few, short or elongate, pedunculate or sessile, the rachis densely lanate; bracts and bractlets rounded-ovate, obtuse or acutish, short-cuspidate, hyaline, whitish-stramineous,

densely short-villous; sepals oblong-oval, 1.5 mm. long, rounded at the apex, 3-nerved, densely pilose with soft white hairs; filaments subulate-linear, shorter than the sepals, the staminodia one-third as long as the filaments, narrowly triangular, entire; style short, the stigmas slender; utricle orbicular, compressed; seed orbicular, 1 mm. broad, dark reddish brown, shining.

Type in the U. S. National Herbarium, no. 636123, collected on a dry hillside at Topolobampo, Sinaloa, Mexico, March 23, 1910, by J. N. Rose, P. C. Standley, and P. G. Russell (no. 13292). Also obtained at the same locality in 1897 by Edward Palmer (no. 191).

Similar in most respects to *Iresine angustifolia*, but distinguished by the well-developed staminodia, the obtuse or rounded rather than acute or acutish sepals, and the densely villous bracts.

Iresine calea (Ibáñez) Standley.

Gomphrena latifolia Mart. & Gal. Bull. Acad. Sci. Brux. 10[1]: 349. 1843.

Alternanthera latifolia Moq. in DC. Prodr. 13[2]: 351. 1849.

Achyranthes calea Ibáñez, Naturaleza 4: 79. 1879.

Iresine latifolia Benth. & Hook. Gen. Pl. 3: 42. 1880, not *I. latifolia* D. Dietr. 1839.

Iresine laxa S. Wats. Proc. Amer. Acad. 21: 454. 1886.

There are very few North American species of Iresine which have so extensive a list of synonyms as the present species. Usually it has been known as *Iresine latifolia* (Mart. & Gal.) Benth. & Hook., but that name is homonymous and consequently not available. In spite of the fact that Ibáñez uses several large pages of text and a colored plate to characterize his proposed species, the present writer is not absolutely certain that that plant is the same as the one heretofore known as *Iresine latifolia*. Ibáñez's description, however, applies better to the latter species than to any other of which the writer has seen specimens, and his material came from a region in which *I. latifolia* is known to grow; for which reasons it seems best to use Ibáñez's name in this application, at least for the present.

Iresine costaricensis Standley, sp. nov.

Scandent shrub, much branched, the branches stout, terete, smooth, the younger ones and those of the inflorescence densely pubescent with short stout appressed fulvous hairs; petioles stout, 7 to 17 mm. long; leaf blades oval to oblong-elliptic, 11 to 18 cm. long, 4 to 7 cm. wide, abruptly acuminate or long-attenuate, obtuse at the base, thick, sparsely short-villous on the upper surface and deep green, appressed-pilose beneath with slender stiff hairs; flowers perfect, in a loose, much branched, naked, terminal panicle sometimes 50 cm. long, the branches slender, spreading, opposite or verticillate, the spikelets 3 mm. thick or less, sessile, few-flowered, the rachis canescent; bracts and bractlets less than half as long as the sepals, suborbicular, fuscous-stramineous, sparsely short-villous; sepals oval-oblong, 1.5 mm. long, obtuse, 3-nerved, brownish-fuscous, densely pilose, the hairs stiff, grayish, scarcely exceeding the sepals; filaments shorter than the sepals, the staminodia short, entire; style short, the stigmas short and stout.

Type in the U. S. National Herbarium, no. 861225, collected at Las Vueltas, Tucurrique, Costa Rica, in 1899, by A. Tonduz (Inst. Fís. Geogr. Costa Rica, no. 13183). Also collected at the same locality by the same collector in 1898 (no. 12919).

The proposed species belongs to that section of the genus which was once given generic rank by Martius under the name Trommsdorffia. It is a relative of *Iresine argentata* (Mart.) D. Dietr., a species occurring in Porto Rico, Colombia, and Venezuela, which has larger flowers, mostly pedunculate spikelets, and acute or abruptly acute leaf blades.

Iresine heterophylla Standley, sp. nov.

Iresine celosioides obtusifolia Coulter, Contr. U. S. Nat. Herb. 2: 364. 1894.
Iresine paniculata obtusifolia Coulter; Uline & Bray, Bot. Gaz. 21: 354. 1896.

Perennial from long slender branching woody rootstocks; stems herbaceous, stout, erect or ascending, solitary or several from a single base, simple up to the inflorescence, 50 to 100 cm. high, swollen at the nodes, often sulcate, short-villous at the nodes, sparsely pubescent elsewhere with very short stout soft hairs, the internodes 1.5 to 10 cm. long; leaves usually asymmetrical, very variable in outline, the lower ones much broader and more obtuse than the upper ones; petioles stout, 2 to 20 mm. long, the uppermost leaves usually sessile or subsessile; blades of the lower leaves broadly rhombic-ovate, often as broad as long, frequently with fascicles of small leaves in the axils, 3 to 6 cm. long, 2 to 4 cm. wide, rounded to acutish, the apex always blunt, rounded or abruptly acute at the base and more or less decurrent, thick and firm, yellowish green, scabrous or smooth on the upper surface, pubescent beneath along the veins with short stiff hairs, scabrous and denticulate on the margins, the veins prominent beneath, coarse, the lateral ones diverging at a very acute angle, nearly parallel and all extending more than halfway to the margin; blades of the upper leaves ovate to narrowly ovate or oval, obtuse or acute, smaller than the lower blades but with similar pubescence; inflorescence a narrow, dense, much branched panicle 15 to 40 cm. long and 3 to 9 cm. broad, the branches erect or ascending, sparsely villous; spikelets stout, densely flowered, 4 to 23 mm. long; bracts one-half to one-third as long as the sepals, ovate-orbicular, acute, entire; sepals 1 to 1.3 mm. long, elliptic-oblong, yellowish white, acuminate to acutish, those of the pistillate flowers 3-nerved; lobes of the staminal cup broadly rounded; utricle shorter than the sepals; seed suborbicular, 0.6 mm. in diameter, dark reddish brown, shining.

Type in the U. S. National Herbarium, no. 304251, collected near the city of Durango, Mexico, in 1896, by Edward Palmer (no. 562).

ADDITIONAL SPECIMENS EXAMINED:

TEXAS: *Wright* 587. *Mexican Boundary Survey* 1199. *Nealley* 231. Uvalde, 1880, *Palmer* 1137. *Lindheimer* 1110. Georgetown, 1880, *Palmer* 1135.
NEW MEXICO: Gila Hot Springs, 1903, *Metcalfe* 827 (Herb. N. Y.).
ARIZONA: Mule Mountains, 1911, *Goodding* 1009.
SONORA: Oputo, 1894, *Hartman* 213.
CHIHUAHUA: Candelaria, 1911, *Stearns* 235. 1885, *Palmer* 291. Santa Eulalia Hills, 1885, *Wilkinson*. Near Chihuahua, 1885, *Pringle* 348.
COAHUILA: 1880, *Palmer* 1136. Sierra de Paila, 1910, *Purpus* 5086 (Herb. Univ. Calif.).

The specimens listed above have been referred to *Iresine celosioides*, but that widely dispersed plant is an annual, or essentially so, with all its leaves similar, and the sepals of the pistillate flowers obtuse or merely acutish.

Iresine nitens Standley, sp. nov.

Erect shrub, sparsely branched, the branches erect, striate, densely and closely pilose-sericeous with lustrous silvery white hairs, glabrate in age; petioles 5 to 7 mm. long; leaf blades lanceolate or ovate-lanceolate, 2 to 6 cm. long, 5 to 13 mm. wide, long-acuminate or acute, acute at the base, thick and firm, when young strigose-pilose with lustrous white hairs, soon glabrate, the lateral veins conspicuous, ascending; flowers dicœcious, paniculate, the panicle on a long naked peduncle, very narrow, elongate, the simple primary branches very short, the spikelets elongate, mostly sessile, the rachis densely lanate; bracts and bractlets of the pistillate flowers equaling the sepals, ovate or ovate-oblong, acute or acuminate, hyaline, stramineous or fuscous, glabrous, the sepals narrowly lanceolate, 2 mm. long, long-attenuate, 3-nerved, densely lanate, the long soft hairs brownish; style nearly as long as the ovary, the stigmas short, slender; utricle oblong, acute; seed 1 mm. long, yellowish brown, shining.

Type in the U. S. National Herbarium, no. 464048, collected at Tehuacán, Puebla, Mexico, September, 1911, by C. A. Purpus (no. 5667).

Closely related to *Iresine schaffneri* S. Wats., but distinguishable by the lustrous pubescence of the stems and by the fact that the leaves are early glabrate rather than permanently pubescent.

Iresine pacifica Standley, sp. nov.

Erect shrub, much branched, the branches ascending, slender, striate, green, glabrous except about the inflorescence, there very sparsely short-villous; petioles slender, 4 to 11 mm. long; leaf blades broadly ovate or rhombic-ovate to lance-oblong, or the uppermost lanceolate, 3.5 to 10.5 cm. long, 1.3 to 4 cm. wide, acute to long-acuminate, acute at the base, thin, glabrous, or very sparsely short-villous along the veins beneath; flowers polygamo-monœcious, in broad, open, much branched, sparsely leafy panicles, the branches elongate, very slender, ascending or spreading, the spikelets short, nearly all sessile, the rachis lanate; bracts and bractlets less than half as long as the flowers, suborbicular, rounded at the apex, short-villous, brown; sepals oval-oblong, 1.5 mm. long, rounded at the apex, 3-nerved, densely pilose with long soft brownish hairs; filaments shorter than the sepals, the staminodia less than half as long as the filaments, narrowly triangular, entire; style short, the stigmas slender; seed orbicular, slightly compressed, 0.6 mm. broad, black and shining.

Type in the U. S. National Herbarium, no. 208570, collected near Manzanillo, Mexico, December, 1890, by Edward Palmer (no. 1074).

ADDITIONAL SPECIMENS EXAMINED:

MEXICO: Manzanillo, 1890, *Palmer* 932. Cerro Colorado, Sinaloa, November 1, 1904, *Brandegee*.

This species is related to *Iresine angustifolia* Euphrasén (*I. elatior* Rich.), but is readily distinguished by the rounded or obtuse bracts and bractlets and the broader leaves.

Iresine rotundifolia Standley, sp. nov.

Low shrub, fruticose nearly throughout, much branched, the branches stout, ascending or divergent, dark gray or blackish, the branchlets stout, densely tomentose; leaves few, remote, undeveloped in the staminate plant at anthesis; petioles stout, 1 to 4 mm. long; leaf blades orbicular to broadly ovate-oval, 3.5 to 17 mm. long, 3.5 to 12 mm. wide, broadly rounded at the base, rounded or obtuse at the apex, sometimes emarginate, coriaceous, deep green and puberulent or glabrate on the upper surface, densely yellowish-tomentose beneath, the veins conspicuous beneath and usually evident on the upper surface; flowers dicœcious; staminate spikelets 6 to 9 mm. long, densely flowered, in fascicles of 2 to 4 at the ends of short fruticose branches; bracts and bractlets ovate-orbicular, less than a third as long as the sepals, scarious, yellowish white, glabrous or nearly so, the sepals narrowly oblong, 3 mm. long, obtuse, sparsely short-villous at the apex; filaments slightly exserted, the tube very short, the staminodia minute; pistillate spikes (immature) short, densely flowered, in short, narrow terminal panicles, the bracts and bractlets broadly ovate, obtuse or acute, fuscous, glabrate.

Type in the herbarium of the University of California (fragment in the U. S. National Herbarium), no. 135872, collected in the vicinity of San Luis Tultitlanapa, Puebla, Mexico, May, 1908, by C. A. Purpus (no. 3452). This specimen is taken from a staminate plant. The pistillate plant, with the inflorescence very immature, was collected at Esperanza in May, 1911, by C. A. Purpus (no. 5864), this also in the herbarium of the University of California.

A very distinct species, because of the prevailingly suborbicular leaves and the peculiar form of the staminate inflorescence.

Iresine stricta Standley, sp. nov.

Erect shrub, 30 to 80 cm. high, sparsely branched, the branches suberect, slender or stout, striate, densely stellate-canescent; petioles stout, 2 to 6 mm. long; leaf blades oblong-oval, ovate-oblong, broadly ovate, or ovate-rhombic, 1.3 to 3.5 cm. long, 5 to 15 mm. wide, rounded or obtuse at the apex, obtuse or rounded at the base, subcoriaceous, stellate-canescent on the upper surface when young, glabrate in age, densely stellate-canescent beneath, subrugose, the veins coarse, prominent beneath, ascending; flowers dicœcious, the panicle on a naked peduncle 10 to 15 cm. long, narrow, the primary branches elongate and ascending or usually very short; spikelets elongate, slender, sessile, the rachis lanate; bracts and bractlets of the staminate flowers half as long as the sepals, broadly ovate, pilose, the sepals oblong, obtuse or acute, pilose, hyaline, dull white; filaments equaling the sepals, the staminodia short, fimbriate at the apex; bracts and bractlets of the pistillate flowers equaling the sepals, pilose, the sepals ovate-lanceolate, 1.5 mm. long, acuminate, 3-nerved, white, densely long-pilose, the hairs exceeding the perianth, soft, white; stigmas elongate, filiform; seed 1 mm. long, reddish brown, shining.

Type in the U. S. National Herbarium, no. 453412, collected near Tehuacán, Puebla, Mexico, in 1905, by J. N. Rose, J. H. Painter, and J. S. Rose (no. 9919).

ADDITIONAL SPECIMENS EXAMINED:

PUEBLA: San Luis Tultitlanapa, 1907, *Purpus* 2834. Cerro de Coatepec, August, 1907, *Purpus* 2757 (Herb. Univ. Calif.).

In general appearance and in floral characters near *Iresine schaffneri* S. Wats., but clearly distinct in its indument of branched hairs.

Iresine tomentella Standley, sp. nov.

Shrub; branches slender, sparsely whitish-tomentose when young, glabrate in age; petioles 0.8 to 1.5 cm. long, tomentulose when young; leaf blades oblong-elliptic, elliptic, or oblanceolate-oblong, 12.5 to 21.5 cm. long, 3.3 to 6.5 cm. wide, cuneate at the base, acute or long-acuminate at the apex, usually somewhat abruptly so, thin, bright green, glabrous above, loosely tomentose beneath along the veins when young, glabrate in age, the lateral veins conspicuous, arcuate-ascending; flowers polygamous, loosely paniculate, the panicle 9.5 cm. long and as broad, the branches ascending, thinly tomentose, the basal bracts linear, 2 to 2.5 cm. long; spikelets sessile, few, flowered, 2 to 2.5 mm. in diameter, the rachis lanate; bracts and bractlets ovate-orbicular, half as long as the sepals, obtuse or acutish, stramineous, hyaline, glabrous; sepals oval, 1.5 to 2 mm. long, obtuse, sparsely lanate at the base, stramineous; staminodia minute.

Type in the U. S. National Herbarium, no. 572522, collected near Gómez Farias-Tamaulipas, Mexico, altitude 350 meters, April, 1907, by Edward Palmer (no. 291).

A near relative of *Iresine arbuscula* Uline & Bray, which is known only from the type locality, Volcán de Tecuamburro, Guatemala, but differing from that species by the tomentose branches and leaves and shorter petioles.

Iresine wrightii Standley, sp. nov.

Shrub; branches slender, terete, smooth, the young ones and those of the inflorescence densely canescent; petioles stout, 3 to 7 mm. long; leaf blades obovate-oblong or oval-oblong, broadest above the middle, 7 to 9 cm. long, 3 to 4 cm. wide, acute at the apex, acute or acuminate at the base, rather thin, sparsely appressed-pilose beneath or glabrate; flowers perfect, paniculate, the panicles pyramidal, loosely branched, naked, the branches spreading, opposite, the spikelets short, pedunculate or sessile; bracts and bractlets one-third as long as the sepals, suborbicular, stramineous, sparsely short-villous or glabrate; sepals elliptic-oblong, 2.5 mm. long, acute, brownish-fuscous, faintly nerved, short-villous at the apex, pilose at the base, the hairs sordid white, stiff, about equaling the sepals; filaments filiform, shorter than the sepals, the staminodia very short, entire; style short, the stigmas short and stout.

Type in the U. S. National Herbarium, no. 48566, collected in Nicaragua by Charles Wright.

This, like *Iresine costaricensis*, is related to *I. argentata*. It differs from the latter, however, in having thin rather than subcoriaceous leaf blades, which are acute at the base and broadest above the middle, rather than rounded at the base and broadest at or below the middle.

NEW OR NOTABLE ALLIONIACEAE.

In the course of preparing a monograph of the North American representatives of the genus Torrubia two undescribed species have been discovered—one from Mexico and one from Guadeloupe. This group has usually been referred to Pisonia, but several years ago Dr. N. L. Britton showed [1] the inconsistency of retaining it in that genus, and transferred to it all the West Indian species then known. A number of West Indian species of Pisonia have since been described which are properly referable to Torrubia and are here transferred to that genus. At the same time it seems desirable to make the proper nomenclatorial combinations for the South American species of Torrubia. There is appended also a description of a new Panamanian species of the closely related genus Neea.

Several years ago the writer proposed the name Commicarpus [2] for that section of the genus Boerhaavia having glanduliferous fruits borne in umbels or verticels. The genus is well marked, besides, by the scandent habit of the plants. At the time the new genus was proposed only the Mexican species were transferred to it. Most of the other species are African. The writer takes this opportunity of transferring them, also, to Commicarpus.

Two South American Allioniaceae, also, described as species of Mirabilis, are here transferred to Allionia.

Neea delicatula Standley, sp. nov.

Branches slender, greenish gray, glabrous, the branchlets slender, ferrugino-puberulent when young but soon glabrate, the internodes short; petioles slender, 4 to 7 mm. long; leaves alternate, the blades elliptic, elliptic-obovate, or oblong-oval, 2.2 to 6 cm. long, 9 to 20 mm. wide, cuneate to acutish at the base, abruptly acuminate at the apex, the tip narrowly triangular, acutish or usually obtuse, the blades thin, deep green, concolorous, glabrous and dull on the upper surface, sparsely rufo-puberulent beneath along the midvein, the margins plane, the lateral veins obsolete or nearly so; peduncles of the staminate cymes 2.2 to 4.5 cm. long, terminal and axillary, nearly filiform, flexuous, glabrous, the cymes few or many-flowered, 2 to 5 cm. wide, the flowers on slender pedicels 4 to 15 mm. long; bractlets triangular-oblong, acute, 1 mm. long, puberulent; staminate perianth urceolate, acutish at the base, 4.5 mm. long, 3 mm. wide, puberulent at the apex, elsewhere glabrate, minutely 5-dentate; stamens 7, the filaments very unequal, the anthers 1 mm. long; pistillate flowers and fruit not known.

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[1] Bull. Torrey Club **31**: 611–615. 1904.

[2] Contr. U. S. Nat. Herb. **12**: 373. 1909.

Type in the U. S. National Herbarium, no. 678516, collected in forests on dry limestone around Alhajuela, Chagres Valley, Panama, altitude 30 to 100 meters, May, 1911, by H. Pittier (no. 3472).

Related to *Neea psychotrioides*, but that species has much larger leaves with more conspicuous veins, broader cymes which are more pubescent, a larger perianth, and usually 5 stamens.

Torrubia dussii Standley, sp. nov.

Pisonia obtusata Heimerl, Bot. Jahrb. Engler **21**: 624. 1896, in part, not *P. obtusata* Jacq.

Tree of medium size; branches stout, rugose, sordid-grayish, the branchlets stout, glabrous except along the nodes, there puberulent, the internodes short; leaves opposite, unequal, the petioles rather stout, 4 to 8 mm. long, glabrous; leaf blades oval or oval-oblong, 8 to 10 cm. long, 4 to 6 cm. wide, rounded or obtuse at the base, abruptly acute or cuspidately short-acuminate at the apex, rarely acute, the tip usually obtuse, thin, concolorous, lustrous above, dull beneath, glabrous, the margins plane, the lateral veins slender, straight, 6 to 12 on each side, the veinlets nearly obsolete, laxly and sparsely reticulate; peduncles stout, 3.5 to 4.5 cm. long, glabrous, the inflorescence cymose, 6 to 8 cm. broad, many-flowered, glabrous, the branches stout, the flowers sessile, glomerate, the bractlets oblong or deltoid-oblong, acutish, 1 mm. long or shorter, glabrous; staminate perianth funnelform-campanulate, 6 to 7 mm. long, glabrous, the limb nearly entire; stamens 6, half longer than the perianth; anthocarp ellipsoid, 11 mm. long, 3 mm. in diameter.

Type in the U. S. National Herbarium, no. 592420, collected in Guadeloupe, April 15, 1893, by Père Duss (no. 2170).

Related to *Torrubia fragrans*, but distinct in the large, nearly glabrous staminate perianth and the glabrous branches of the inflorescence.

Torrubia potosina Standley, sp. nov.

Branches slender, grayish, striolate, the branchlets slender, sparsely ferrugino-puberulent when young, the internodes 1.5 to 7 cm. long; leaves opposite, subequal or unequal, the petioles slender, 4 to 6 mm. long, sparsely ferrugino-puberulent; leaf blades oval or oblong-oval, rarely orbicular-oval, 5 to 10.5, or rarely only 3.5, cm. long, 2.2 to 5 cm. wide, rounded or acutish at the base, acute or usually cuspidately acute or acuminate at the apex, thin, glabrous, concolorous, slightly lustrous on the upper surface, the lateral veins prominent, divergent, nearly straight, about 8 on each side, laxly anastomosing near the margins, the secondary veins laxly and inconspicuously reticulate; pistillate peduncles terminal and axillary, 2.5 to 7.5 cm. long, very slender, sparsely puberulent or glabrous, the inflorescence few-flowered, cymose-paniculate, 1.5 to 3.5 cm. long, the branches opposite or dichotomous, divergent, sparsely ferrugino-puberulent, the flowers solitary or in cymules of 3, sessile or on pedicels 4 mm. long or shorter, the bractlets acute, about 0.5 mm. long, puberulent; pistillate perianth elliptic-oblong, 2.5 to 3 mm. long, slightly constricted in the throat, sparsely puberulent, the teeth triangular, acute, erect; anthocarp oval, 7 mm. long and 4.5 mm. in diameter; fruit finely striate; seed elliptic-oblong, 6 mm. long and 2.5 to 3 mm. in diameter, brown.

Type in the U. S. National Herbarium, no. 570197, collected near Rascón, San Luis Potosí, Mexico, June, 1905, by Edward Palmer (no. 675).

The proposed species is of particular interest, since it is the second Torrubia to be reported north of Costa Rica. The other Mexican species, *T. linearibracteata*, has been described only recently, from Yucatán. *Torrubia potosina* is related, apparently, to *T. costaricana* and *T. linearibracteata*, but differs from both in its lax, few-flowered inflorescence and broader leaves.

Torrubia areolata (Heimerl) Standley.
Pisonia areolata Heimerl, Nat. For. Kjöbenhavn Vid. Medd. **1890**: 159. 1891.

Torrubia boliviana (Britton) Standley.
Pisonia boliviana Britton, Bull. Torrey Club **27**: 125. 1900; Heimerl, Bot. Jahrb. Engler **42**: 80. 1908.

Torrubia cafferiana (Casar.) Standley.
Pisonia cafferiana Casar. Nov. Stirp. Bras. Dec. 68. 1842.

Torrubia campestris (Netto) Standley.
Pisonia campestris Netto, Ann. Sci. Nat. V. **5**: 83. 1866.

Torrubia combretiflora (Mart.) Standley.
Pisonia combretiflora Mart.; Schmidt in Mart. Fl. Bras. **14**[3]: 360. 1872.

Torrubia coriifolia (Heimerl) Standley.
Pisonia coriifolia Heimerl in Urban, Symb. Antill. **7**: 213. 1912.

Torrubia cuspidata (Heimerl) Standley.
Pisonia cuspidata Heimerl, Bot. Jahrb. Engler **21**: 628. 1896.

Torrubia domingensis (Heimerl) Standley.
Pisonia obtusata domingensis Heimerl in Urban, Symb. Antill. **7**: 215. 1912.

Torrubia eggersiana (Heimerl) Standley.
Pisonia eggersiana Heimerl, Bot. Jahrb. Engler **21**: 627. 1896.

Torrubia ferruginea (Klotzsch) Standley.
Pisonia ferruginea Klotzsch; Choisy in DC. Prodr. **13**[3]: 445. 1849.

Torrubia fragrans (DuM. de Cours.) Standley.
Pisonia fragrans DuM. de Cours. Bot. Cult. ed. 2. **7**: 114. 1814.
Pisonia inermis Jacq. err. det. Griseb. Fl. Brit. W. Ind. 71. 1864, in part.

Torrubia graciliflora (Mart.) Standley.
Pisonia graciliflora Mart; Schmidt in Mart. Fl. Bras. **14**[3]: 358. 1872.

Torrubia harrisiana (Heimerl) Standley.
Pisonia harrisiana Heimerl in Urban, Symb. Antill. **7**: 214. 1912.

Torrubia hassleriana (Heimerl) Standley.
Pisonia hassleriana Heimerl, Oesterr. Bot. Zeitschr. **56**: 426. 1906.

Torrubia hirsuta (Choisy) Standley.
Pisonia hirsuta Choisy in DC. Prodr. **13**[3]: 445. 1849.

Torrubia laxiflora (Choisy) Standley.
Pisonia laxiflora Choisy in DC. Prodr. **13**[3]: 444. 1849.

Torrubia ligustrifolia (Heimerl) Standley.
Pisonia ligustrifolia Heimerl in Urban, Symb. Antill. **7**: 507. 1913.

Torrubia linearibracteata (Heimerl) Standley.
Pisonia linearibracteata Heimerl, Repert. Nov. Sp. Fedde **12**: 221. 1913.

Torrubia luteovirens (Heimerl) Standley.
Pisonia luteovirens Heimerl, Oesterr. Bot. Zeitschr. **56**: 425. 1906.

Torrubia microphylla (Heimerl) Standley.
Pisonia microphylla Heimerl in Urban, Symb. Antill. **7**: 215. 1912.

Torrubia nitida (Mart.) Standley.
Pisonia nitida Mart.; Schmidt in Mart. Fl. Bras. 14²: 356. 1872.

Torrubia noxia (Netto) Standley.
Pisonia noxia Netto, Ann. Sci. Nat. V. 5: 80. *pl.* 7. 1866.

Torrubia olfersiana (Link, Klotzsch & Otto) Standley.
Pisonia olfersiana Link, Klotzsch & Otto Icon. Pl. Rar. 1: 36. *pl. 15.* 1841.

Torrubia pacurero (H. B. K.) Standley.
Pisonia pacurero H. B. K. Nov. Gen. & Sp. 2: 218. 1817.

Torrubia paraguayensis (Heimerl) Standley.
Pisonia paraguayensis Heimerl, Verh. Zool. Bot. Ver. Wien 62: 7. 1912.

Torrubia pernambucensis (Casar.) Standley.
Pisonia pernambucensis Casar. Nov. Stirp. Bras. Dec. 69. 1842.

Torrubia salicifolia (Heimerl) Standley.
Pisonia salicifolia Heimerl in Urban, Symb. Antill. 7: 216. 1912.

Torrubia schomburgkiana (Heimerl) Standley.
Pisonia schomburgkiana Heimerl, Jahresb. Staats-Oberrealsch. Fünfhaus 23: [Reprint, 34.] 1897.

Torrubia tomentosa (Casar.) Standley.
Pisonia tomentosa Casar. Nov. Stirp. Bras. Dec. 69. 1842.

Torrubia suspensa (Heimerl) Standley.
Pisonia suspensa Heimerl, Med. Rijks Herb. Leiden 19: 34. 1913.

Torrubia uleana (Heimerl) Standley.
Pisonia uleana Heimerl, Bot. Jahrb. Engler 42: 80. 1908.

Torrubia venosa (Choisy) Standley.
Pisonia vernosa Choisy in DC. Prodr. 13²: 444. 1849.

Commicarpus grandiflorus (A. Rich.) Standley.
Boerhaavia grandiflora A. Rich. Tent. Fl. Abyss. 2: 209. 1851.

Commicarpus plumbagineus (Cav.) Standley.
Boerhaavia plumbaginea Cav. Icon. Pl. 2: 7. *pl. 112.* 1793.

Commicarpus repandus (Willd.) Standley.
Boerhaavia repanda Willd. Sp. Pl. 1: 22. 1797.

Commicarpus squarrosus (Heimerl) Standley.
Boerhaavia squarrosa Heimerl, Bull. Herb. Boiss. 4: 813. 1896.

Commicarpus tuberosus (Lam.) Standley.
Boerhaavia tuberosa Lam. Tabl. Encycl. 1: 10. 1791.

Commicarpus verticillatus (Poir.) Standley.
Boerhaavia verticillata Poir. Dict. Sci. Nat. 5: 56. 1804.

Allionia arenaria (Heimerl) Standley.
Mirabilis arenaria Heimerl, Bot. Jahrb. Engler 42: 74. 1908.

Allionia campanulata (Heimerl) Standley.
Mirabilis campanulata Heimerl, Bot. Jahrb. Engler 42: 75. 1908.

NEW CAESALPINIACEAE FROM PANAMA.

The genus Cassia is represented in Panama by at least 20 species of diverse forms. Three of them appear to be new and are described here. There occur in the same region 10 species of Chamaecrista, one of which is undescribed. In this connection there are included also two new combinations in Chamaecrista, for species occurring in Panama.

Cassia falcinella Standley, sp. nov.

Stems terete or very obscurely 5-angled, striate, copiously cinereous-puberulent with tawny hairs; leaves numerous, approximate; stipules linear, falcate, 10 mm. long, 0.75 mm. wide, green, nerved, subulate-tipped, cinereous-puberulent; rachis of the leaf about 35 mm. long, tipped with a subulate appendage 3 mm. long, the lower pair of leaflets borne 20 to 25 mm. above the base; petiolar glands 2, one or rarely 2 glands borne between each pair of leaflets, 2 to 3 mm. long, slender-cylindric or rarely conic, acute, black; leaflets 2 pairs, asymmetrical, oblong-obovate to elliptic-oblong, 5 to 8 cm. long, 2 to 4 cm. wide, abruptly long-acuminate at the apex, the tip acute, 14 mm. long or less, obtuse or rounded and unequal at the base, firm in texture, subcoriaceous, glabrous, lustrous on the upper surface, concolorous, conspicuously veined; inflorescence a dense many-flowered leafy terminal panicle, its branches densely cinereous-puberulent with yellow hairs; peduncles rather stout, 7 to 18 mm. long; bracts similar to the stipules but shorter and thinner, some of them narrowly linear-lanceolate and not falcate; sepals subequal, 4 mm. long, oblong-ovate, obtuse, densely pubescent with short appressed curved yellow hairs; petals bright yellow, about 13 mm. long, oblong or oblong-oblanceolate, obtuse, clawed, abundantly cinereous on the outer surface; anthers glabrous, nearly equal, the 3 lower slightly beaked; ovary strongly curved, densely covered with appressed yellowish hairs.

Type in the U. S. National Herbarium, no. 715333, collected in the vicinity of San Felix, eastern Chiriquí, Panama, altitude 120 meters or less, December, 1911, by H. Pittier (no. 5147).

Closely related to *Cassia undulata*, but distinguished readily by the narrower stipules and bracts and by the broader, abruptly acuminate leaflets. In that species the stipules are more than 2 mm. wide and the bracts of the inflorescence oblong-lanceolate to oval, while the leaflets are acute or abruptly acute.

Cassia caudata Standley, sp. nov.

Mature stems not seen, the young ones slender, terete, glabrous; rachis of the leaves terete, striate, 15 to 19 cm. long, the lower pair of leaflets borne 9 to 12 cm. above the base; stipules not seen; petiolar gland one, 2.5 mm. long, obtusely conic, borne between the lower pair of leaflets; petiolules stout, about 5 mm. long; leaflets 2 pairs, elliptic-oblong to ovate, 13 to 21 cm. long, 7 to 9 cm. wide, obtuse or rounded at the base and slightly unequal, acutish at the apex and abruptly contracted into an acute caudate tip 15 to 30 mm. long, thin, glabrous, bright green on the upper surface but not lustrous, decidedly paler beneath; leaflets of the lower pair shorter and broader than those of the upper; inflorescence of axillary several-flowered racemes or panicles about 7 cm. long, the branches appressed-puberulent with yellowish hairs; bracts linear-subulate, 3 mm. long; pedicels ascending, 15 to 20 mm. long; calyx lobes unequal, 4 to 7 mm. long, obtuse, sparingly puberulent, green; petals bright yellow with dark veins, about 20 mm. long, 12 mm. wide or less, rounded at the apex, conspicuously clawed; anthers glabrous, slightly unequal, the 3 lower with short cylindric beaks; ovary terete, densely appressed-pubescent.

Type in the U. S. National Herbarium, no. 679652, collected in forests of the upper Mamoní River, Province of Panama, Panama, altitude 150 to 400 meters, October, 1911, by H. Pittier (no. 4491).

In Bentham's revision of the genus this falls into the section Chamaefistula, series Bacillares.[1] It is related to *Cassia bacillaris* and *C. inaequilatera*, but from these and their allies it differs in having long-caudate leaflets. From each species it differs also in various minor respects.

Cassia regia Standley, sp. nov.

Tree; older branches blackish gray, slightly furrowed; young branches succulent, obtusely 5-angled, densely velvety-pubescent with short yellowish hairs; stipules linear-subulate, 2 mm. long, early deciduous; rachis of the leaf about 30 cm. long, the lowest pair of leaflets borne 2 cm. above its base, densely velvety-pubescent; petiolar glands none; leaflets about 20 pairs, approximate, narrowly oblong, 26 to 60 mm. long, 10 to 16 mm. wide, the lower and the uppermost shorter than those along the middle of the rachis, all acute, or the lower obtuse, apiculate, slightly unequal at the base and from truncate to acute, lustrous on the upper surface, conspicuously veined, and furnished with numerous fine short stiff appressed hairs, beneath slightly paler, with sparse, short, spreading or appressed hairs, more prominently veined than on the upper surface; petiolules very thick, about 1 mm. long; inflorescence of numerous slender, solitary or clustered racemes 10 to 16 mm. long, borne on the old branches, densely velvety-pubescent with short hairs; bracts subulate, small, deciduous before anthesis; pedicels ascending, 14 to 18 mm. long; sepals subequal, 7 mm. long, 4 mm. wide, oval-oblong, rounded at the apex, purple, with rather few minute appressed hairs; petals 12 mm. long, 8 mm. wide, orbicular-oval or broadly obovate, rounded at the apex, contracted at the base into a slender claw, pale yellow with conspicuous purple veins, glabrous; anthers 2 mm. long, sparingly pilose, the lobes smooth; ovary strongly curved, densely covered with appressed whitish hairs.

Type in the U. S. National Herbarium, no. 677196, collected around El Paraíso, Canal Zone, Panama, altitude 30 to 100 meters, January 24, 1911, by H. Pittier (no. 2532). Additional material is mounted on sheet 677197.

Similar to *Cassia grandis*, but readily distinguished by its purple, sparingly pubescent sepals, and by its acute leaflets. The pubescence of the leaflets is much less abundant than in *C. grandis*, where it might be called tomentose. Specimens of the two species are very unlike in general appearance.

Chamaecrista simplex Standley, sp. nov.

Annual; stems erect, very slender, simple or with a few erect branches above, sparingly cinereous below, densely so above; leaves few and distant; stipules narrowly linear-lanceolate, 10 to 13 mm. long, attenuate, aristate-tipped, appressed, strongly nerved, ciliolate; rachis of the leaf 65 to 80 mm. long, bearing leaflets to within 3 or 4 mm. of the base; petiolar gland sessile, cup-shaped, inserted just below the lowest pair of leaflets; leaflets 18 to 25 pairs, oblong or linear-oblong, 5 to 7 mm. long, about 1.5 mm. wide, acutish, mucronate, very oblique at the base, glabrous, ciliolate, rather thick and subcoriaceous, very prominently pinnate-nerved, the midvein excentric; flowers few in each cluster, on pedicels 3 mm. long or less, the bracts similar to the stipules but smaller and broader; sepals lanceolate, 5 mm. long, acute or acuminate, appressed, pubescent; petals about 6 mm. long; legumes erect, 35 to 40 mm. long, 4 mm. wide, obtuse, short-beaked, abundantly hirtellous.

Type in the U. S. National Herbarium, no. 679815, collected in the Sabana de Dormisolo, near Chepo, Province of Panama, Panama, at an altitude of 60 to 80 meters, October, 1911, by H. Pittier (no. 4655).

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[1] Trans. Linn. Soc. Bot. 27: 519. 1871.

Related, perhaps, to *C. patellaria*, which it resembles in the sessile petiolar glands, but from which it differs conspicuously enough in the slender, simple or nearly simple stems with appressed pubescence, and in the small, subcoriaceous leaflets which are very oblique at the base.

Chamaecrista stenocarpa (Vog.) Standley.
Cassia stenocarpa Vog. Gen. Cass. Syn. 68. 1837.

Chamaecrista tagera (L.) Standley.
Cassia tagera L. Sp. Pl. 538. 1753.

NEW OR NOTABLE MIMOSACEAE FROM PANAMA.

This characteristically tropical family is well represented in Panama by both herbaceous and woody forms. A new species each of Calliandra, Morongia, and Mimosa is described here. An old subspecies of Mimosa published by Bentham appears to deserve specific rank and is redescribed.

Calliandra pittieri Standley, sp. nov.

A tree with a flat crown; branches grayish or yellowish green, smooth, the younger ones puberulent and sparingly appressed-pilose with tawny hairs; stipules persistent, linear-lanceolate, acute, 3 mm. long, ciliolate, slightly puberulent; rachis of the leaf 45 to 105 mm. long, slender, densely cinereous-puberulent; pinnæ 7 to 11 pairs, 20 to 55 mm. long; leaflets 20 to 65 pairs, linear or oblong-linear, 3 to 5 mm. long, less than 1 mm. wide, acute to obtuse, minutely scabrous-ciliolate with a few longer hairs interspersed, otherwise glabrous, rather prominently veined, the midvein nearly central, pale green, lustrous on the upper surface; inflorescence axillary, the solitary or clustered peduncles slender or stout, 15 to 45 mm. long, sparingly puberulent; flowers rather few in each head, sessile; calyx 1.25 mm. long, campanulate, glabrous or obscurely puberulent, the teeth very short and separated by broad sinuses; corolla short-funnelform, 5 to 6 mm. long, sparingly short-puberulent or appressed-pilose, the lobes oblong-lanceolate, obtuse; stamens pink, about 3 cm. long; fruit densely pubescent with short yellow hairs, the margins very thick, the valves coriaceous (only imperfect specimens seen).

Type in the U. S. National Herbarium, no. 531146, collected at La Esmeralda, near Jamundí, Cauca Valley, State of Cauca, Colombia, at an altitude of 1,200 meters, January, 1905, by H. Pittier (no. 951).

Apparently the same is a specimen in flower, collected near Cana, Panama, in 1908 by R. S. Williams (no. 707). This is from a small tree nearly 5 meters high, with a trunk 10 cm. in diameter. The Panama plant has slightly smaller and more obtuse leaflets than the type, but seems not to differ otherwise.

The proposed species is related to *Calliandra purdiaei* Benth., but differs in having much smaller flowers as well as more numerous and smaller leaflets.

Mimosa panamensis (Benth.) Standley.
Mimosa debilis panamensis Benth. Trans. Linn. Soc. Bot. 30: 391. 1875.

Stems slender, prostrate, sparingly setose-hirsute, abundantly armed with stout recurved spines 4 mm. long or less; stipules linear, rigid, 4 mm. long, strongly nerved, pectinate-ciliate; petioles 15 to 25 mm. long, sparingly setose and bearing a few very slender spines; pinnæ a single pair, each consisting of 2 pairs of leaflets, the inner leaflet of the lower pair much reduced; leaflets oblong-obovate, 8 to 18 mm. long, 4 to 7 mm. wide, very unequal at the base, but the midvein only slightly excentric, from rounded to acutish at the apex, mucronate, short-strigose on the upper surface, beneath more densely strigose; peduncles slender, 12 to 35 mm. long, glabrous; bracts

of the capitate inflorescence linear, subulate-tipped, pectinate-ciliate, inconspicuous; corolla puberulent, not striate; stamens 5, 6 mm. long; corolla puberulent, not striate; legumes narrowly oblong, 16 mm. long or less, 3 mm. wide, acute, short-beaked, acute at the base and nearly sessile, densely spiny-hispid, the slender spines 2 to 3 mm. long.

TYPE LOCALITY: Panama, in meadows near the town of Nata; type collected by Seemann (no. 98).

SPECIMENS EXAMINED:

PANAMA: Aguadulce, Province of Coclé, in savannas, near sea level, *Pittier* 4952. Ancón Hill, *Brother Celestine* 66.

This seems worthy of specific rank, differing from *Mimosa debilis* in its numerous spines, broader stipules, and narrow leaflets.

Known in Panama as "dormidera de escobilla" and "ciérrate de escobilla" (Brother Celestine).

Mimosa williamsii Standley, sp. nov.

A slender vine with trailing stems 2 meters long or more; branches terete, green-glabrate or very sparsely retrorse-strigose, unarmed, or with a very few short slender spines; stipules linear, acuminate, 3 to 4 mm. long, rigid, erect, canescent, pectinate, ciliate; petioles slender, 35 to 60 mm. long, tipped with a subulate appendage 4 to 7 mm. long, retrorsely strigose and puberulent, each bearing 1 or 2 slender recurved spines 1.5 mm. long; pinnæ 1 pair, divergent, their rachises 15 to 20 mm. long; leaflets 2 pairs on each rachis, the inner one of the lower pair usually much reduced and not more than one-fifth the length of the others; leaflets elliptic-oblong to oblong-oblanceolate, very unequal at the base, the midvein strongly excentric, acutish, abruptly contracted into a mucro 1.5 mm. long, setose-strigose on the upper surface and with numerous very slender soft white hairs, beneath densely strigose; peduncles slender, 15 to 32 mm. long, glabrous or nearly so, ascending or recurved; bracts of the capitate inflorescence linear, with subulate tips, scarcely equaling the corollas; corolla about 2 mm. long, glabrous, not striate; stamens 5; fruit oblong or oval, 8 to 20 mm. long, about 7 mm. wide, obtuse or abruptly acute at the apex and bearing a subulate tip 2 mm. long, contracted at the base into a stipe 3 to 4 mm. long, 1 to 3-seeded, the valves plane, articulate, abundantly setose-strigose and cinereous-puberulent.

Type in the U. S. National Herbarium, no. 677919, collected in the vicinity of Penonomé, Panama, February or March, 1908, by R. S. Williams (no. 101).

Most closely related to *Mimosa albida*, but differing conspicuously in its prominently stipitate, short, few-seeded fruit, sparse, retrorse-strigose pubescence, and glabrous corolla.

Morongia pilosa Standley, sp. nov.

Stems prostrate, stout, sharply 5-angled, green, copiously pilose with slender white hairs, armed on the angles with numerous slender recurved spines 2 mm. long; stipules setaceous, erect, 3 mm. long; petioles 35 to 80 mm. long, slender, pilose, closely beset with rather stout recurved spines, bearing 5 to 7 closely approximate pairs of pinnæ; rachises of the pinnæ 12 to 25 mm. long; leaflets 11 to 22 pairs, the lowest pair borne almost at the base of the rachis, linear-oblong, 3.5 mm. long, hardly 1 mm. wide, thin, smooth, appressed-pilose, obtuse, oblique at the base, sessile; peduncles 5 to 8 mm. long, rather stout, villous, bearing numerous short recurved spines, solitary or 2 together, axillary or racemose at the ends of the branches; heads of flowers small, 3 to 4 mm. in diameter exclusive of the stamens; bracts linear, setaceous-tipped, pilose-ciliate; corolla glabrous, short-stipitate; stamens pink, exserted 3 to 4 mm.; mature fruit not seen, the slightly developed ovaries 4-angled, glabrous on the faces and smooth, densely setose-hispid on the angles.

Type in the U. S. National Herbarium, no. 679704, collected along the Camino del Boticario, near Chepo, Province of Panama, Panama, altitude 30 to 50 meters, October, 1911, by H. Pittier (no. 4544).

Related to *Morongia distachya* (DC.) Cook & Collins, a species of southern Mexico, but differing in its numerous short, approximate pinnæ, which are leaflet-bearing nearly to the base, its pilose stems, and its smaller heads of flowers, these supported on shorter peduncles.

NEW PANAMANIAN FABACEAE.

During the study of the herbaceous representatives of this family collected in Panama by Mr. Pittier there have been discovered specimens of several South American species not hitherto known from North America. It is expected that an account of these will be published later. New species of several genera have also been detected, diagnoses of which are published here.

Bradburya heteroneura Standley, sp. nov.

Perennial vine with slender prostrate or climbing stems, these pubescent with short white slender hairs or glabrate; stipules lanceolate or lance-ovate, acuminate, 3 to 4 mm. long, closely parallel-nerved, glabrous; petioles 6 to 25 mm. long, puberulent or soft-pubescent or glabrate; petiolules 1 to 1.5 mm. long; stipellæ subulate, 2 to 3 mm. long; leaves pinnately trifoliolate, the leaflets lanceolate to narrowly oblong-lanceolate, 22 to 45 mm. long, 4 to 11 mm. wide, acute or obtuse, mucronulate, rounded or subcordate at the base, thick and somewhat coriaceous, bright green, scaberulous on the upper surface, glabrous beneath, the prominent veins much reticulated, 8 to 12 of the lateral ones much more conspicuous than the others, diverging from the midvein at an acute angle and anastomosing near the margin; peduncles short, axillary, 7 mm. long or less, 1 or 2-flowered, white-villous; pedicels glabrous, about 7 mm. long, the bracts at their base 6 to 7 mm. long, broadly ovate, deeply cordate-clasping; bracts at the base of the calyx ovate, inequilateral, 15 mm. long, acute, finely parallel-nerved, finely pubescent on the outer surface, twice as long as the calyx or more; calyx broadly campanulate, thin, pale, the upper lobes almost wanting, the margin appearing undulate, the lower lobe linear, equaling or exceeding the tube, finely villous; flowers blue, the standard with a yellowish spot; standard 25 to 30 mm. long and of the same breadth, the upper edge nearly straight, finely soft-pubescent outside; keel and wings 15 to 20 mm. long; young fruit linear, long-beaked, glabrous, the margins much thickened.

Type in the U. S. National Herbarium, no. 678060, collected near Penonomé, Panama, February or March, 1908, by R. S. Williams (no. 328).

This is most nearly related to *Bradburya angustifolia*. The venation of the leaves is very different in *B. heteroneura* and the bracts are pubescent instead of glabrous.

Canavalia bicarinata Standley, sp. nov.

Slender vine with purplish flowers; young stems finely tomentose with tawny hairs, the older ones glabrate; stipules small, linear-subulate, deciduous; petioles stout, 15 to 55 mm. long, finely tomentose or in age glabrate; stipellæ deciduous; petiolules 3 mm. long, densely pubescent with tawny hairs; leaflets ovate to ovate-oblong or elliptic-ovate, abruptly short-acuminate, the tip obtuse or emarginate, rounded to cordate at the base, dull green, thick and subcoriaceous, prominently veined, finely soft-pubescent on the upper surface, becoming glabrate, beneath sparingly pubescent with mostly appressed hairs; racemes 11 to 27 cm. long, rather slender, the rachises finely appressed-pubescent or glabrate, conspicuously nodulose, with numerous somewhat remote flowers; bracts and bractlets much shorter than the calyx, broadly ovate, obtuse or acutish, conspicuously parallel-nerved, glabrous but ciliolate; pedicels very

short and thick, scarcely more than 1 mm. long; calyx tubular-campanulate, 12 mm. long, the lobes short, the upper broad and truncate, the lower smaller, ovate, obtuse, the whole green, appressed-pubescent; corolla about 25 mm. long, the banner emarginate, the keel and wings of about the same length, the keel very narrow, strongly incurved; legumes oblong-linear, 11 to 14 cm. long, 15 to 18 mm. wide, densely sericeous with short white hairs; valves keeled along the sutures, and each with 2 longitudinal keels 1 to 2 mm. high, these about equidistant from the margins and from each other; seeds numerous, oval-oblong, 9 mm. long, flattened laterally, dark brownish or greenish black, more or less splotched with a lighter tint.

Type in the U. S. National Herbarium, no. 676590, collected in clearings around Alhajuela, Province of Panama, Panama, altitude 30 to 100 meters, January 11 or 12, 1911, by H. Pittier (no. 2354).

ADDITIONAL SPECIMENS EXAMINED:

PANAMA: Vicinity of Penonomé, *Williams* 132.

COSTA RICA: Nicoya, *Pittier*.

Readily distinguished from the other Panamanian species by the 2 keels of each valve of the legume. The only other species with similar fruit is *Canavalia acuminata* Rose,[1] which has larger legumes, differently shaped seeds, and thin, glabrous leaflets of very different outline. That species is known only from Manzanillo, Mexico.

Dolicholus angulatus Standley, sp. nov.

Stems twining, the young ones stout, sharply 3-angled, very densely tomentose with short, soft, straight, whitish or tawny hairs; stipules persistent, large, 7 to 15 mm. long, ovate or oblong-ovate, rounded to rather obtuse, sessile, foliaceous, finely parallel-nerved, densely tomentose; petioles stout, angled, densely villous or tomentose, 4 to 6 cm. long; petiolules very stout, about 4 mm. long; stipellæ subulate, equaling the petiolules; leaflets broadly ovate or rounded-ovate, 35 to 80 mm. long, abruptly short-pointed, entire, rounded at the base, bright green, abundantly sericeous on the upper surface, beneath densely soft-pubescent and sparingly gland-dotted, the terminal leaflet larger than the lateral ones, the latter somewhat inequilateral; racemes rather slender, 10 to 15 cm. long, the rachises angled, tomentose, the flowers numerous, sometimes remote and subverticillate; bracts soon deciduous, lanceolate or lance-oval, abruptly long-acuminate, shorter than the calyx; pedicels stout, very short, 1 to 2 mm. long; calyx 1 cm. long, slightly accrescent in age, the lobes several times longer than the very short tube, subequal, lanceolate, acuminate, 3 mm. wide or less, glabrous or sparingly pubescent within, densely tomentose outside, conspicuously pinnate-nerved; corolla yellow, slightly shorter than the calyx; standard ovate, rounded at the apex, short-clawed, with very small rounded auricles, glabrous; wings and keel of about the same length as the standard, the keel somewhat incurved; mature fruit not seen, the very young legume densely pubescent along the margins, gland-dotted, 2-ovuled.

Type in the U. S. National Herbarium, no. 676693, collected along the railroad between Miraflores and Pedro Miguel, Canal Zone, Panama, altitude 30 to 50 meters, January 21, 1911, by H. Pittier (no. 2510).

This is related to *D. reticulatus*, but differs conspicuously in the large, persistent stipules, the glabrous banner, and the broader calyx lobes.

Dolicholus ixodes Standley, sp. nov.

Perennial from a slender or sometimes woody root; stems rather stout, terete, erect or twining, densely glandular-hirsutulous; stipules lanceolate, 4 to 5 mm. long, acute, rather persistent, brown, with few parallel nerves, sparingly pubescent; petioles slender, 12 to 18 mm. long, densely viscid-hirsutulous and glandular; petiolules about 1 mm. long; leaflets ovate-triangular, 10 to 25 mm. long, 11 to 20 mm. broad, acute or

[1] Contr. U. S. Nat. Herb. 1: 322. 1895.

abruptly acute, broadly rounded or truncate at the base, prominently veined, dull green, densely viscid-pubescent on both surfaces; racemes axillary, 3 to 11 cm. long, with 3 to 7 flowers near the apex, the rachis pubescent like the stems; bracts shorter than the calyx, inconspicuous; pedicels 2 to 4 mm. long; calyx about 5 mm. long, the lobes about twice as long as the campanulate tube, subequal, the lowest slightly longer than the others, all linear or linear-lanceolate, attenuate, densely viscid-hirsute with tawny hairs; corolla 8 to 9 mm. long, reddish brown, the banner broadly oblong, viscid-pubescent outside, the keel and wings of about the same length; legumes about 16 mm. long, elliptic-oblong, acutish, sessile, viscid-hirsute with yellow hairs and glandular, short-beaked; seeds 2, 3.5 mm. long, flattened, dark reddish brown.

Type in the U. S. National Herbarium, no. 677931, collected in the vicinity of Penonomé, Panama, in February or March, 1908, by R. S. Williams (no. 119). The same collector's no. 581, from the vicinity of Penonomé, also belongs here.

The plant is related to *D. phaseoloides*, but differs widely in its lesser stature, small leaflets, dense, viscid pubescence, few-flowered racemes, and pubescent legumes which are not constricted between the seeds.

Dolicholus calycosus (Hemsl.) Standley.

Rhynchosia calycosa Hemsl. Diag. Pl. Mex. 48. 1880.

Erythrina darienensis Standley, sp. nov.

Petioles somewhat fleshy, 10 to 13 cm. long, sparingly and minutly puberulent, bearing a large (4 mm. high) cuplike gland at the base of each lateral leaflet; leaflets thin, bright green, glabrous, or sparingly puberulent upon the veins beneath, the terminal ones 15 to 16 cm. long and of the same breadth, rhombic-ovate, obtuse but abruptly short-pointed, broadly rounded at the base; lateral leaflets similar in outline to the terminal one but inequilateral and smaller, 13 to 14 cm. long; petiolules stout, 1 cm. long; inflorescence of stout racemes 8 to 19 cm. long aggregated at the ends of the branches, their rachises densely and very finely tomentulose with tawny hairs; pedicels stout, divergent, 5 mm. long or less; calyx campanulate, 7 mm. long, 5 to 6 mm. broad, contracted into a short stipelike base, truncate at the top and entire except for a very short triangular lower tooth, minutely tomentulose-puberulent; banner recurved, about 45 mm. long and 15 mm. wide, elliptic, obtuse, sessile, glabrous; keel 35 mm. long, falcate, obtuse or acutish, the petals 10 mm. wide near the base, united for nearly their whole length; wings rhombic-oval, obtuse, 10 mm. long; stamens 10, the filaments of 9 of them united nearly to the top, that of the tenth free nearly to the base; ovary long-stipitate, tomentulose.

Type in the U. S. National Herbarium, no. 715845, collected near Boca de Pauarandó, on the Sambú River, southern Darién, Panama, at an altitude of about 20 meters, February, 1912, by H. Pittier (no. 5578).

Distinguished from the South American species with united keel petals by the narrow standard. The glands of the petioles seem to be peculiar to this plant.

Erythrina darienensis is a characteristic tree of the flats along the Sambú River, attaining a height of 30 meters. The straight trunk is 1.2 meters in diameter, with grayish bark, supported at the base by "saponemas" or buttresses. The wood is soft and white. The young branches are armed with short spines.

Meibomia maxonii Standley, sp. nov.

Section Chalarium. Much branched shrub about 2 meters high; stems stout, brown, terete, the younger ones densely hirsute with white hairs, the older ones becoming glabrate; stipules distinct, persistent, broadly lanceolate to broadly ovate, 5 to 8 mm. long, abruptly long-acuminate, finely parallel-nerved, brown, thin, glabrous within, densely and coarsely sericeous on the outer surface; petioles 10 to 22 mm. long, hirsute; leaflets ovate to oblong or oval, 20 to 38 mm. long, 11 to 23 mm. wide, obtuse to acutish, rounded at the base, thick, dull green, conspicuously reticulate-veined, sparingly pubescent on the upper surface with short, closely appressed hairs, or glabrate,

beneath abundantly hirsute with soft white or tawny hairs; inflorescence consisting of numerous short-peduncled terminal racemes, these 4 to 8 cm. long, loosely many-flowered, the rachises abundantly hirtellous with tawny hooked hairs; bracts similar in form and pubescence to the stipules, large, conspicuous before anthesis, early deciduous; pedicels slender, ascending, about 10 mm. long; calyx 3 mm. long, purplish, hirsute, the upper lobe triangular-ovate, acutish; corolla 10 mm. long, bright deep purple; loment short-stipitate, the stipe slightly shorter than the calyx; joints 4 to 6, 4 to 4.5 mm. long, with a central isthmus, rhombic-oval, with more or less contorted edges, thick and turgid, obscurely reticulate, sparingly uncinate-puberulent.

Type in the U. S. National Herbarium, no. 675728, collected on open, brushy, steep slopes, Cuesta de Cerro Quemado, eastern slope of Chiriquí Volcano, Panama, altitude 1,900 meters, March 11, 1911, by William R. Maxon (no. 5370). Additional material is mounted on sheet 675727.

Also collected by Mr. H. Pittier at the same place on the same date (no. 3112).

A most distinct member of the section Chalarium, readily distinguished from the other shrubby species by the abundant, white, hirsute pubescence, the large, deep purple flowers, and the rhombic, contorted joints of the loment.

Phaseolus chiriquinus Standley, sp. nov.

Stems stout, striate-angled, sparingly pubescent with short, fine, straight or curled, whitish hairs, or glabrous; stipules triangular-lanceolate, acute, small, thin, brownish; petioles stout, 25 to 40 mm. long, hirtellous; petiolules thick, 3 to 4 mm. long, tawny-villous or hirtellous; stipellæ 1.5 to 2 mm. long, ovate to oblong-linear, acutish, 1-nerved; leaflets ovate to oblong-ovate, 4 to 7 cm. long, 4.5 cm. wide, acute or abruptly short-acuminate, rounded at the base, prominently veined, pubescent on the upper surface with fine spreading hairs, beneath sericeous with tawny hairs; racemes 10 to 38 cm. long, much exceeding the leaves, the rachis stout, obtusely angled, hirtellous with tawny hairs, glabrate below, the flowers very numerous, in fascicles of 2 to 5; bracts linear, acute, 4 to 6 mm. long, appressed-pubescent, somewhat persistent; pedicels slender, 4 to 9 mm. long, ascending; calyx campanulate, 3 to 4 mm. long, copiously pubescent with short tawny hairs, the lobes shorter than the tube, the upper one broad and low, emarginate, the 3 lower ones ovate, acutish, slightly longer, the mouth of the calyx very oblique; bractlets very small, much shorter than the calyx; banner purple, the wings and keel pale yellowish, more or less tinged with purple; banner about 14 mm. long and 12 mm. wide, rounded-obovate, recurved, deeply emarginate, glabrous, narrowed at the base and with a rounded auricle on each side, this folded over against the inner surface, glabrous; wings narrow, about equaling the banner, with a rounded auricle at the base; keel strongly spirally coiled; young legumes flat, broadly falcate, about 3 times as long as broad, mostly 4-ovuled, very densely pubescent with loose tawny hairs.

Type in the U. S. National Herbarium, no. 677501, collected on the Cuesta de Cerro Quemado, eastern slope of Chiriquí Volcano, Panama, altitude 1,800 to 2,160 meters, March 10 to 13, 1911, by H. Pittier (no. 3111).

From the form of the fruit, this plant evidently belongs to the group Drepanospron. It is related to *Phaseolus multiflorus* Willd., but differs in its more elongate inflorescence, numerous flowers, shorter pedicels, and small, deciduous bractlets.

NEW OR NOTABLE SPECIES OF GERANIUM FROM COLOMBIA AND VENEZUELA.

In a large collection of plants secured in Venezuela by Dr. Alfredo Jahn there are specimens of several species of Geranium. One of these is apparently new, while a second has been known previously only from the type collection. In 1906 Mr. Pittier obtained in Colombia specimens of another Geranium which can not be referred to any published species.

Geranium stoloniferum Standley, sp. nov.

Perennial from a thickened caudex covered by the persistent imbricated stipules and petiole bases; plants producing long slender prostrate branches 30 to 50 cm. long, these rooting at the nodes and forming there thick caudices similar to the basal ones; stems slender, puberulent and bearing numerous somewhat retrose or spreading, subhispid hairs, the tips of the branches ascending, the internodes 2.5 to 15 cm. long; leaves numerous, usually densely clustered at each node; stipules lanceolate, attenuate into a long subulate tip, 6 to 20 mm. long, dark brown to nearly black, puberulent on the outer surface; petioles slender, those of the basal leaves 5 to 8 cm. long, several times as long as the blades, those of the upper cauline leaves mostly shorter than the blades and only 2 to 10 mm. long; leaf blades rounded to subreniform in outline, 10 to 28 mm. broad, thick and firm, yellowish green, prominently veined, at first sparsely hispidulous on the upper surface but soon glabrate, abundantly hispidulous beneath along the veins and the revolute margins, the blades 5-cleft (or the smaller ones only 3-cleft) about three-fifths the distance to the base, the divisions broadly obovate to cuneate in outline, very shallowly 3-lobed at the apex, the lobes obtuse to broadly rounded, the divisions of the smaller leaves sometimes entire; peduncles usually 2-flowered, about 15 mm. long, much longer than the subtending leaves, densely pilose with spreading whitish hairs and somewhat villous; bracts 4 to 5 mm. long, lanceolate, attenuate to a subulate tip; pedicels slender, 8 to 25 mm. long, densely pilose with spreading gland-tipped hairs; sepals 5 mm. long, narrowly oblong or elliptic-oblong, acutish, short-mucronate, pilose with spreading, often gland-tipped hairs; petals 1 cm. long, broadly cuneate-spatulate to obovate, shallowly emarginate, nearly glabrous; fruit not seen.

Type in the U. S. National Herbarium, no. 602320, collected in the Páramo de la Cristalina, State of Trujillo, Venezuela, at an altitude of 2,900 meters, December 20, 1910, by Dr. Alfredo Jahn (no. 126).

It is not possible to determine with certainty the color of the petals, since they are discolored, but they appear to have been white or pink. Apparently of the same species is a specimen from the Páramo de Timotes, State of Táchira, collected at an altitude of 3,000 to 3,500 meters, in March, 1910, by Doctor Jahn (no. 164). This is a mere fragment, but it agrees in the form of the leaves and flowers.

The proposed species belongs to the section Diffusa, as outlined by Dr. R. Knuth.[1] It differs from most of the species of that section in its peculiar habit, bracteate 2-flowered peduncles, and revolute leaf margins. It is most closely related to *Geranium diffusum* H. B. K., a plant with ascending or nearly erect stems, mostly shorter petioles, much shorter stipules (3 to 4 mm. long), and petals only 7 mm. long. It is also related to two Venezuelan species, *G. lindenianum* Turcz. and *G. subnudicaule* Turcz., but both these are of different habit and have incised leaf divisions.

[1] In Engl. Pflanzenreich 53: 209. 1912.

Geranium velutinum Turcz. Bull. Soc. Nat. Moscou **31**[1]: 417. 1858.

Specimens agreeing very well with the original description of this species were collected in the Páramo de Timotes, State of Táchira, Venezuela, at an altitude of 3,000 to 3,500 meters, in March, 1910, by Dr. Alfredo Jahn (no. 5). The type was collected by Funck and Schlim (no. 1251) in the Páramo de Portechuelo, State of Mérida, Venezuela, at an altitude of 2,500 to 2,700 meters. Knuth, in his monograph of the genus, places the species doubtfully in the section Gracilia.[1] If the present specimen is correctly determined, the species can be better placed in some other section.

Geranium confertum Standley, sp. nov.

Plant perennial, densely cespitose with much thickened caudices from a stout elongate frutescent root; leaves and flowers all basal; stipules 10 to 15 mm. long, scarious, stramineous, ovate or oblong-ovate, attenuate to a filiform tip, glabrous or nearly so; petioles stout, 1.5 to 5 cm. long, densely pilose with short, spreading or retrorse hairs, slightly viscid; leaf blades rotund in outline, 1 to 2 cm. wide, cleft three-fifths the distance to the base into 5 or 7 broadly cuneate divisions, these 3-lobed at the apex, the lobes ovate to oval, rounded at the apex, the whole blade firm and subcoriaceous, dull green, prominently veined, sparsely pubescent on the upper surface with slender appressed hairs, glabrate in age, abundantly pilose beneath along the veins with spreading hairs; flowers very numerous, the peduncles 1-flowered, ebracteate, 15 to 20 mm. long, densely pilose with spreading or retrorse white hairs; sepals 7 to 8 mm. long, oblong-linear or lance-linear, acute, short-mucronate, pilose-ciliate, especially near the base, sparsely pilose; petals purplish pink, 12 to 15 mm. long, narrowly spatulate, rounded at the apex, glabrous; fruit about 9 mm. long, the valves and beak densely pubescent with short stiff spreading hairs.

Type in the U. S. National Herbarium, no. 531305, collected in the Páramo de Buena Vista, Huila Group, Central Cordillera, State of Cauca, Colombia, at an altitude of 3,000 to 3,600 meters, January, 1906, by H. Pittier (no. 1107).

A member of the section Andina proposed by Knuth [2] and most nearly related to *Geranium sessiliflorum* Cav., a species which ranges in the Andes from Bolivia to Patagonia. In the U. S. National Herbarium there are several collections of that species, some of which are cited by Knuth. *Geranium sessiliflorum* is similar in habit to the species here described, but it has mostly appressed pubescence, thin and more deeply parted leaves, densely hirsute, smaller sepals (only 4 to 5 mm. long), and smaller, white petals.

WERCKLEA, A NEW GENUS OF MALVACEAE.

The tree here described was first discovered by Mr. Pittier in 1898 at a time when he was unable to collect specimens of it. Later, material was secured under his direction, which is the basis of the description here published. It is one of the most showy members of the Malvaceae, the flowers equaling in size those of any species of Hibiscus and being borne in great profusion. Very few, if any, of the arborescent members of that genus reach so large a size.

[1] In Engl. Pflanzenreich **53**: 104. 1912.

[2] In Engl. Pflanzenreich **53**: 78. 1912.

WERCKLEA Pitt. & Standl., gen. nov.

A tree of medium size; leaves alternate, long-petioled, the blades broadly rounded, entire or repand-undulate, palmately nerved; stipules broad and foliaceous; pubescence sparse, of short stellate hairs; flowers solitary in the axils, long-peduncled; involucre tubular-campanulate, shallowly 3-lobed, usually split nearly to the base on one side by the developing flower; calyx narrowly campanulate, 5-lobed to about the middle, the lobes acute, 3-nerved; petals 5, united for a short distance at the base with each other and with the stamen tube, spatulate-oblanceolate, somewhat clawed, palmately nerved; stamen tube striate, one-third as long as the petals, antheriferous for half or two-thirds its length, shallowly 5-lobed at the summit; anthers oblong, longitudinally dehiscent; ovary sessile, 5-celled; ovules pendulous, numerous in each cell, amphitropous; style filiform, striate, with 5 ascending branches; stigmas capitate or fimbriate; capsule oblong, with a long stout beak at the apex, broadly winged along the sutures by the well developed exocarp; seeds ovoid-reniform, hispid.

Wercklea is a member of the subfamily Hibisceae, and is most closely related to the genus Hibiscus. Several important points of difference, however, make it unwise to refer it to that genus. The involucre is merely 3-lobed before anthesis, while in all species of Hibiscus the bracts are separate. Paritium, sometimes referred to Hibiscus, has united bracts, but they are 5 instead of 3. The winged capsule, oblong anthers, and comparatively few stamens are other distinguishing features, but the best, perhaps, is the fact that the ovules are amphitropous rather than anatropous.

The genus is named for Mr. C. Werclé, the collector of the type, who has botanized extensively in little known regions of Central America and Colombia.

Wercklea insignis Pitt. & Standl., sp. nov.

A tree 9 to 10 meters high with a trunk 30 to 40 cm. in diameter and a rounded top; young branches stout and succulent, sparingly pubescent with whitish stellate hairs; stipules foliaceous, orbicular or broader to obovate or oblong, sessile by a broad base, entire; petioles 6 to 32 cm. long; leaf blades reniform-orbicular, 15 to 40 cm. broad, entire or repand-undulate, bright green, with a few scattered stellate hairs on the upper surface and more numerous ones beneath, the principal veins usually 7; peduncles stout, 5 to 14 cm. long, stellate-pubescent at anthesis but soon glabrate; involucre monophyllous, 14 to 20 mm. long, 3-lobed, the sinuses often very shallow but sometimes extending nearly to the base, the lobes obtuse or rounded, sparingly stellate-pubescent, cleft almost half way to the base; calyx lobes triangular or triangular-ovate, acute; corolla about 12 cm. long and of the same breadth; petals spatulate-oblanceolate, obtuse to truncate at the apex, entire, lilac rose, yellow at the base, sparingly pilose; capsule oblong, 5 cm. long, with a stout beak 10 to 12 mm. long, densely hispid, glabrous within, with thin double wings along the angles, these dividing with the dehiscence of the capsule; seeds 3 mm. long, dark brown, densely covered with stiff tawny hairs about 3 mm. long.

Type in the U. S. National Herbarium, no. 678449, collected in the forests near La Palma, central Costa Rica, altitude about 1,460 meters, by C. Werclé. Additional material of the same collection is mounted on sheets 678448 and 678451.

ADDITIONAL SPECIMENS EXAMINED:

COSTA RICA: La Palma, September 8, 1898, *Tonduz* (Inst. Fís. Geogr. Costa Rica, no. 12536). Cultivated in a garden, Guadalupe, October, 1910, *Jiménez* 19.

The tree grows in the humid forest at the summit of the mountains about La Palma, a region swept by the moist trade winds from the east. The surrounding trees are usually covered with lichens and other epiphytes, but the trunks of Wercklea are bare of such growths.

PELTAEA, A NEW GENUS OF MALVACEAE.

There is a small group of Malvaceae, consisting of 4 to 6 species, which has generally been treated as a section of Malache (Pavonia), although two of the species were described by Presl in the genus Malachra. The plants of this group in general appearance are very unlike the species of true Malache, and are distinguished also by the large leaflike floral bracts and the peltate-appendaged involucral bracts. The writer wishes to propose for the genus the name Peltaea, first used by Presl for a section of Malachra.

PELTAEA (Presl) Standley, gen. nov.

Malachra section *Peltaea* Presl, Rel. Haenk. 2: 125. 1836.
Pavonia section *Peltaea* Gürke in Mart. Fl. Bras. 12[3]: 475. 1892.

Low shrubs, or sometimes herbaceous plants woody only at the base, with slender or stout branched stems; pubescence usually abundant and composed of stellate hairs; leaves usually broad, petiolate, toothed; stipules narrow, commonly deciduous; inflorescence capitate or subcapitate, 3 to 10-flowered, on a long axillary peduncle, or sometimes sessile; bracts large, similar to the leaves, 1 or 2 subtending each head of flowers and usually surpassing them and concealing the carpels; bracts of the involucre 8 to 11, in a single series, each commonly with a peltate enlarged blade at the apex, at least always enlarged toward the apex; calyx campanulate, 5-lobed; petals yellow or purplish red, showy; stamen tube and pistil about equaling the petals; styles 10, rather short, erect; stigmas capitate; carpels 5, blunt, sometimes mucronulate, glabrous or pubescent, with a longitudinal dorsal nerve, elsewhere smooth or obscurely rugulose; seeds glabrous.

TYPE SPECIES: *Pavonia sessiliflora* H. B. K.

Peltaea ovata (Presl) Standley.

The type was collected on the Isthmus of Panama by Haenke. Two Panama collections may be referred here: Fendler's no. 21, from Chagres, and Pittier's no. 2149, from "among bushes around Culebra." It seems fairly certain that these specimens represent Presl's species, although one can not be absolutely certain without examining the type. They differ from *P. sessiliflora* in having 5-nerved or 3-nerved, lanceolate or lance-ovate leaves, with a short rough pubescence and pubescent carpels. In *P. sessiliflora* the leaves are 7-nerved, broadly ovate-cordate, and velvety with a very dense pubescence and the carpels are glabrous.

Peltaea riedelii (Gürke) Standley.

Pavonia riedelii Gürke in Mart. Fl. Bras. 12[3]: 493. *pl. 91. f. 2.* 1892.
Province of Matto Grosso, Brazil.

Peltaea sessiliflora (H. B. K.) Standley.

Pavonia sessiliflora H. B. K. Nov. Gen. & Sp. 5: 281. 1821.
Pavonia bracteosa Benth. Journ. Bot. Hook. 4: 118. 1842.
Malachra trinervis Presl, Rel. Haenk. 2: 126. 1836.
Trinidad and Panama to Colombia and Brazil.

Peltaea speciosa (H. B. K.) Standley.

Pavonia speciosa H. B. K. Nov. Gen. & Sp. 5: 231. *pl. 477.* 1821.
Colombia and Venezuela to Brazil and in the West Indies.

THE GENUS LOPIMIA.

This genus of Malvaceae, described by Martius in 1823, was recognized by several writers in the earlier part of the nineteenth century, but in later years has always been included in Pavonia. Indeed, it has not been separated even as a subgenus or section. To the writer, the two species to be placed here seem well worthy of generic recognition. The genus may be characterized as follows:

LOPIMIA Mart.

Lopimia Mart. Nov. Act. Acad. Caes. Leop. Carol. 11: 96. 1823.

Branched shrubs with large ovate-cordate soft-pubescent toothed petioled leaves; stipules and bracts linear to subulate, persistent or deciduous; flowers on axillary, 1 to many-flowered peduncles near the ends of the branches, numerous, appearing paniculate, the clusters of the inflorescence mostly shorter than the leaves; bracts of the involucre 12 to 22, linear or narrowly linear-lanceolate, densely pubescent, in a single series; calyx very short, one-fourth as long as the involucral bracts or shorter, shallowly lobed; corolla large and showy, much exceeding the involucre, the petals somewhat clawed at the base, entire, densely soft-pubescent on the outer surface; stamen tube about as long as the corolla; style branches 10, slender, elongate, exceeding the corolla, erect, the stigmas small, capitate, tuberculate or pubescent; carpels 5, more or less reticulate, at maturity with a thin viscid mucilaginous coating, becoming glabrous and shining when dried, rounded at the apex, readily separable when mature from the ringlike hollow gynobase, tardily if at all dehiscent; seeds reniform, smooth, glabrous.

The genus was held distinct, originally, because of the mucilaginous covering of the carpels and the very numerous involucral bracts. In the second species of the genus listed here from Panama the bracts are only 12, a number equaled in true species of Malache (Pavonia). The mucilaginous coating of the carpels, however, suffices to distinguish the genus. When dry this gives the fruit a glossy appearance quite unlike that of the dull surface of species of Malache. In addition, the two species of Lopimia are very different in general appearance from the members of the genus Malache by the large, showy, very numerous flowers and the broad, densely soft-pubescent leaves. Another character worthy of mention is found in the very short, thin calyx which is pressed almost flat by the growth of the carpels. In the form of the flowers and fruit, Lopimia suggests Malvaviscus rather than Malache.

Lopimia dasypetala (Turcz.) Standley.

Pavonia dasypetala Turcz. Bull. Soc. Nat. Moscou 31: 189. 1858.

TYPE LOCALITY: Near San Cristóbal, Province of Mérida, Venezuela, at an altitude of 750 meters.

RANGE: Costa Rica to Venezuela.

SPECIMENS EXAMINED:

PANAMA: Without locality, *Hayes* 216. Sunny edge of forest, railroad relocation between Gorgona and Gatún, *Pittier* 2273. Lion Hill, Gatún, *Goldman* 1855.

COSTA RICA: Térraba, February 5, 1891, *Pittier*.

A shrub 1 to 3 meters high, with purplish pink flowers.

This is probably the plant collected by Hayes (no. 482) reported by Hemsley[1] as *Pavonia velutina* St. Hil., that name being a synonym of *Lopimia malacophylla*.

Our Panamanian and Costa Rican plants may not be true *dasypetala*, for the writer has seen no Venezuelan specimens. They agree fully with the original description of the species, but this is not as complete as might be desired. Turczaninow states that

[1] Biol. Centr. Amer. Bot. 1: 117. 1879.

the fruit does not have a mucilaginous coat, but he makes the same statement of *Lopimia insignis* Fenzl, which is a synonym of *L. malacophylla*. He could not be certain regarding this point from dried fruit alone.

The only other species of this genus known at present is the type species, *Lopimia malacophylla*. It is characterized by its numerous (18 to 22) involucral bracts, *L. dasypetala* having usually only 12. These are much wider, too, in the latter species. There are other prominent differences besides, *L. dasypetala* having a less abundant pubescence and larger flowers.

Lopimia malacophylla has a wide range in South America, extending from Colombia and Bolivia through most of Brazil. It is found also in Cuba and in southern Mexico. From the latter region Hemsley [1] reports a single specimen collected by Jurgensen (no. 909). In the National Herbarium there is a second sheet, collected by E. W. Nelson (no. 2479) near Plunia, Oaxaca, altitude 900 to 1,440 meters, March 17, 1895. Seeds of this collection were brought to Washington, where the plants were grown in the greenhouse, flowering and fruiting in 1897. It may be that the plant in Mexico is introduced.

FOUR NEW SPECIES OF MALACHE FROM PANAMA AND COSTA RICA.

Many of the species of Malache (better known under the name Pavonia) are widely dispersed tropical weeds. Others, however, are local in their distribution. To the latter group belong four species of Panama and Costa Rica which appear to be without names.

Malache fulva Standley, sp. nov.

Stems stout, flexuous, densely pubescent with short stout white hairs, besides being densely hispid with long yellow hairs; stipules subulate, 5 to 8 mm. long, deciduous, hispid; leaf blades elliptic-oblong, asymmetrical, 7 to 14 cm. long, 26 to 55 mm. wide, abruptly short-acuminate, rounded at the base, coarsely crenate or crenate-dentate, pinnately veined, abundantly hispid on both surfaces, some of the hairs sometimes branched; petioles stout, 9 mm. long or less, densely hispid, the uppermost leaves nearly sessile; peduncles solitary in the axils or in a terminal few-flowered corymb, 20 to 75 mm. long, stout, abundantly hispid; involucral bracts about 10, linear-subulate, 15 to 20 mm. long, hispid with yellow bristles; calyx 4 mm. long, puberulent, shallowly lobed, the lobes broad and rounded; flowers not seen; fruit hemispheric, scarcely lobed; carpels 5, glabrous, with prominent dorsal and lateral nerves and less prominent transverse ones, each carpel with 3 slender spinose processes at the apex, these spreading, about 1 cm. long, retrorsely barbed at the apex; seeds brown, puberulent.

Type in the U. S. National Herbarium, no. 578479, collected in cultivated fields at the Hacienda de Chirripó, Costa Rica, altitude 100 meters, March, 1900, by H. Pittier (Inst. Fís. Geogr. Costa Rica, no. 16080). An additional specimen examined is from the Hacienda de Zent, Costa Rica (*Tonduz* 388).

A member of the subgenus Typhalaea, but not closely related to any described species of the group. The leaves are similar in size and outline to those of *M. typhalaea* and *M. rosea*, but the inflorescence and fruit are very different. *Malache fulva* may be distinguished at once from all the Mexican and Central American species by the abundant yellow, hispid pubescence.

[1] Biol. Centr. Amer. Bot. 1: 117. 1879.

Malache maxonii Standley, sp. nov.

Stems herbaceous, about 70 cm. high, stout, branched, densely hispid with stiff, fulvous, stellate or sometimes simple hairs; petioles stout, 7 to 30 mm. long, hispid like the branches; leaf blades obovate to rhombic-obovate or oblanceolate-oblong, 10 to 18 cm. long, 3 to 7 cm. wide, acute to somewhat abruptly acuminate, narrowed to the base, coarsely and very irregularly crenate, sometimes doubly crenate, some of the lobes often much enlarged, hispidulous on both surfaces with stiff, spreading, yellowish, simple or stellate hairs, more densely so beneath; stipules linear-subulate, 9 to 12 mm. long; peduncles axillary or terminal, loosely branched, hispid, 8 to 15 cm. long; pedicels 1 to 10 cm. long, elongating in age, sparsely hispid or glabrate; bracts at the base of the pedicels 5 to 9 mm. long, hispid, 3-parted into linear lobes; involucral bracts 10 to 12, linear, about 8 mm. long, united only at the base, hispidulous with simple or 2-parted hairs; calyx scarcely more than half as long at the bracts, finely pubescent with short stout stellate hairs, the lobes broadly triangular; corolla pink, 8 to 10 mm. long, the petals finely and sparsely stellate-pubescent on the outer surface; carpels of the fruit 7 mm. high, thin-walled, smooth on the back, glabrous, each bearing 3 slender, erect, retrorsely barbed beaks of about the same length.

Type in the U. S. National Herbarium, no. 693056, collected on a partially shaded bank by the trail in the forest along the Río Ladrillo, above El Boquete, Chiriquí, Panama, at an altitude of 1,200 to 1,300 meters, March 17 to 19, 1911, by William R. Maxon (no. 5394). Additional material of the same collection is mounted on sheets nos. 675761 and 675762. Also collected by Mr. Pittier (no. 3287) in the same locality at the same time.

In general appearance this resembles *M. rosea*, but it is amply distinct in the 3-parted bracts and coarse pubescence. The inflorescence, too, is not congested as in that species, but is loose and open. The proposed species is related to two South American ones, *Malache peruviana* and *M. warmingiana*, both of which have very different involucral bracts.

Malache panamensis Standley, sp. nov.

Annual, 1 meter high or less, simple at the base, with numerous ascending branches above; branches slender, minutely cinereous, with an admixture of long soft white hairs above, especially on the peduncles; leaves rather numerous, ovate to oblong-ovate or lanceolate, 3.5 to 7 cm. long, 1.6 to 3.2 cm. wide, rather abruptly acuminate, rounded to subcordate or cordate at the base, the lobes often overlapping, coarsely but evenly serrate, the teeth acute, 3 or 5-nerved, when 5-nerved the two lateral nerves less conspicuous than the others, bright green on the upper surface but sparsely scaberulous, dull and slightly paler beneath and sparsely pubescent with very slender short stellate hairs; petioles slender, 1.6 to 3.2 cm. long, cinereous and often pilose; stipules subulate, 3 mm. long or less, early deciduous; pedicels 1-flowered, solitary in the axils, slender, 2 to 3 cm. long, ascending, jointed above the middle, pilose or short-pubescent; involucral bracts usually 8, linear, 6 to 8 mm. long, acute, hirsute-ciliate and slightly cinereous; calyx half to two-thirds as long as the bracts, cleft halfway to the base or more, the lobes oblong-lanceolate to triangular, acute, 3-nerved, ciliate and somewhat hirsute, whitish near the base but green near the tip; corolla white, the petals spreading, broadly oblong, rounded or emarginate, short-clawed, ciliolate, sparingly pubescent on the outer surface; stamen tube less than half as long as the petals, glabrous; styles 10, spreading, stout, little exceeding the stamen tube; stigmas capitate, rounded, pubescent; carpels 5, about half as long as the bracts, rounded at the apex, glabrous, smooth or obscurely nerved; seeds very dark brown, pubescent with short coarse appressed hairs.

Type in the U. S. National Herbarium, no. 677212, collected on the edge of the forest, Sabana de Panama, Canal Zone, Panama, altitude 10 to 50 meters, January 25, 1911, by H. Pittier (no. 2548).

An additional specimen examined is from Chepo, Province of Panama, altitude 60 meters (*Pittier* 4448).

Related to *Pavonia geminiflora* Moric., but differing in its pubescent seeds, lack of glandular pubescence, narrow, fewer nerved leaves, and smaller flowers. The leaves of the type specimen suggest the leaflets of *Clematis virginiana* and its allies. Another plant which resembles *M. panamensis* in vegetative characters is *Malache arachnoidea* (Presl) Kuntze. That species, however, has spiny carpels. The name *arachnoidea* is given to the species of western Mexico, not because of the character of the pubescence, as one might expect, but on account of the resemblance of the fruit and bracts to the body and legs of a spider.

Malache penduliflora Standley, sp. nov.

Stems slender, branched, densely pubescent with short stiff tawny stellate hairs; petioles stout, 6 to 12 mm. long, densely stellate-hispidulous; leaf blades elliptic to elliptic-oblong or even obovate, usually broadest at the middle but sometimes above the middle, 8.5 to 15 cm. long, 2.5 to 5.5 cm. wide, long-acuminate, sometimes abruptly so, more or less oblique at the base and rounded, thin, bright green, stellate-hispidulous with tawny hairs on both surfaces, rather sparsely so on the upper surface; stipules 4 to 5 mm. long, linear, long-attenuate, soon deciduous; flowers solitary, axillary, pendulous, on stellate-hispidulous peduncles 2 to 8.5 cm. long; involucral bracts 8 to 10, united only at the base, linear, attenuate, about 7 mm. long, densely stellate-hispidulous; calyx of the same length as the bracts, the lobes ovate, acute, reddish, finely pubescent with stiff stellate hairs; corolla pink, 12 mm. long; carpels 5, about 9 mm. high, reddish, glabrous, coarsely reticulate-veined on the back, each bearing 3 retrorsely barbed spines about 5 mm. long.

Type in the U. S. National Herbarium, no. 677582, collected in the humid forest around Los Siguas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of about 1,700 meters, March 17 to 19, 1911, by H. Pittier (no. 3188).

In the form of the flowers and in the small stipules this resembles *Malache leucantha*, a South American species, but that has a broad, much branched inflorescence and the involucral bracts are united for nearly half their length.

A NEW WALTHERIA FROM COLOMBIA.

The plant described below was distributed as *Waltheria involucrata* Benth., "narrow bracted form." It is not closely related, however, to that species, in which the bracts are united, thin, and accrescent. Apparently it is allied to the Panamanian *Waltheria glomerata* Presl, which is distinguished by its obovate-oblong leaves, rounded at the base, its closely sessile flower clusters, and its narrower acute bracts.

Waltheria subcordata Standley, sp. nov.

Young branches densely and finely stellate-pubescent, slender, straight, the internodes 3 to 8 cm. long; stipules linear-subulate, 4 to 7 mm. long; petioles stout, 1 to 2 cm. long, densely and finely stellate-pubescent with brown hairs; leaf blades narrowly oblong-ovate to broadly ovate or rounded-ovate, 6.5 to 13 cm. long, 2.5 to 9.5 cm. wide, acute at the apex, subcordate or even cordate at the base, often inequilateral, finely or coarsely crenate, densely and finely stellate-pubescent on the upper surface when young, becoming glabrate in age, somewhat paler beneath and velvety-pubescent with short stellate hairs; flowers in dense clusters 1 to 2 cm. broad, these peduncled in the axils of the leaves, or the upper racemose; peduncles 5 to 12 mm. long, or some of the clusters sometimes subsessile; flowers usually 2 together, subtended by several bracts, these distinct, 6 mm. long, usually obovate-spatulate but sometimes narrowly oblanceolate, obtuse, finely and very densely stellate-pubescent; flowers very shortly

pediceled; calyx obpyramidal, 6 mm. long, the lobes triangular, acute, about half as long as the tube; corolla yellow, about equaling the calyx; fruit not seen.

Type in the U. S. National Herbarium, no. 533011, collected in the region of Santa Marta, Colombia, at an altitude of 150 meters, by Herbert H. Smith (no. 493).

NEW OR NOTABLE EBENACEAE FROM MEXICO.

There are here included descriptions of 3 new species of Diospyros and 2 of Maba, chiefly from the western coast of Mexico. Several species of these two genera have been described from Mexico, but most of them are poorly represented in American herbaria. The Mexican species of Diospyros are particularly interesting. Probably most of them are of local distribution.

The common persimmon of the eastern United States, *Diospyros virginiana*, apparently deserves greater attention than has heretofore been given it. Early American botanists, notably Pursh and Rafinesque, believed that two or more species of Diospyros occurred in the eastern United States. Casual inspection of the material in the National Herbarium inclines the writer to the belief that at least two distinct forms are included under *virginiana*, and probably several species can be distinguished when there has been accumulated a large amount of herbarium material properly annotated. At present the material available is altogether insufficient for a critical study of the supposed aggregate.

Maba latifolia Standley, sp. nov.

Section Macreightia. Shrub or small tree; branches slender, dark brown or grayish, the branchlets densely hirtellous with short fulvous hairs, glabrate in age; petioles stout, 1.5 to 3 mm. long, densely hirtellous; leaf blades broadly oblong, oval, or oval-obovate, 3.2 to 6.5 cm. long, 1.7 to 3 cm. wide, rounded at the apex or broadly obtuse, rounded or obtuse at the base, subcoriaceous, grayish green on the upper surface and sparsely puberulent, or densely short-villous when young, beneath copiously short-villous, the margins slightly revolute, the veins prominent beneath, coarsely reticulate; flowers not known; fruit solitary, axillary, subsessile on a very short thick pedicel; fruiting calyx 3-lobed nearly to the base, the lobes orbicular-ovate, obtuse or rounded at the apex, coarsely veined, densely puberulent throughout; fruit subglobose, about 2.5 cm. in diameter, yellowish outside and densely pubescent about the apex, elsewhere glabrate, 6-celled, the pulp reddish; seeds oval or oval-oblong in outline, 11 mm. long, 6 to 7 mm. in diameter, about 5 mm. thick, acute or obtuse on the inner edge, dark reddish brown, finely and distinctly rugulose.

Type in the U. S. National Herbarium, no. 637592, collected in dry coastal thickets near Guadalupe, Sinaloa, Mexico, April 18, 1910, by J. N. Rose, Paul C. Standley, and P. G. Russell (no. 14709). Specimens in fruit, just coming into leaf, were collected on a dry hillside at Mazatlán, Sinaloa, April 7, 1910 (*Rose, Standley & Russell* 14147).

Three species of Maba, all of the section Macreightia, have been described from Mexico: *M. intricata* (A. Gray) Hiern, from Cape San Lucas, Lower California; *M. albens* (Presl) A. DC., from Acapulco; and *M. acapulcensis* (H. B. K.) Hiern, also from Acapulco. The habitats of two other species, *M. pavonii* (A. DC.) Hiern and *M. salicifolia* (H. B. K.) Hiern, are doubtful and may be Mexican. Judging from descriptions, the present species is clearly distinct from all of these, differing from each in definite characters of the fruit, leaf outline, or pubescence. Unfortunately only two

of the five species, *M. intricata* and *M. albens*, are represented in the National Herbarium by specimens. The last mentioned species, until recently unrepresented, was collected on the Cerro de Picacho, Oaxaca, in July, 1914, by C. A. Purpus (no. 7176).

Maba verae-crucis Standley, sp. nov.

Branches slender, the older ones gray, the branchlets at first canescent but later glabrate; petioles 3 mm. long, densely covered with short appressed hairs; leaf blades rhombic-obovate or elliptic-oblanceolate, 5.5 to 8.5 cm. long, 1.8 to 4 cm. wide, narrowed at both ends, acute or acuminate at the apex, acute at the base, thin, green, concolorous, the upper surface at first canescent but finally glabrate and obscurely papillose, the lower surface sparsely strigose, minutely pellucid-punctate, the midvein impressed above, prominent beneath, the lateral veins and the veinlets weak and inconspicuous; flowers not known; fruits solitary, axillary, on very stout pedicels 3 to 4 mm. long; fruiting calyx 15 mm. broad, shallowly 3-lobed, the lobes broadly rounded, densely sericeous and smooth inside, coarsely rugose and sparsely sericeous outside; fruit subglobose, 12 to 16 mm. in diameter, 6-celled, glabrate at maturity, but sericeous when young; mature seeds not seen.

Type in the U. S. National Herbarium, no. 569278, collected at Catemaco, Veracruz, Mexico, altitude 300 meters, April 26, 1894, by E. W. Nelson (no. 429).

This proposed species appears to be related to *Maba acapulcensis*, but it differs in its smaller fruit and shallowly lobed calyx, and it does not have the hirtellous leaves ascribed to the latter.

Diospyros blepharophylla Standley.

Diospyros ciliata A. DC. in DC. Prodr. 8: 229. 1844, not *D. ciliata* Raf. 1836.

Diospyros palmeri Eastw. Proc. Amer. Acad. 44: 604. 1909.

The species was described from fruiting material collected in the vicinity of San Dieguito, San Luis Potosí, Mexico, early in June, 1905, by Dr. Edward Palmer (no. 631). In 1907 Dr. Palmer made two additional collections of the same species in the vicinity of Victoria, Tamaulipas (nos. 116 and 369). These are exactly like the one from San Luis Potosí. One of them (no. 116) bears very young fruits, upon some of which the corolla still persists. This is globose-urceolate, about 5 mm. long, glabrous outside near the base, but puberulent above. The corolla lobes are oval, rounded at the apex, glabrous on the inner surface, but densely pubescent on the outer. The species is a member of the section Danzleria, to which *Diospyros virginiana* also belongs, but there is little resemblance in the general appearance of the two species.

Diospyros rosei Standley, sp. nov.

Section Paralea. Tree with persistent leaves; branches covered with grayish brown bark having numerous lighter colored lenticels, the branchlets slender, brownish yellow, puberulent when young but soon glabrate; leaves alternate, on stout petioles 6 to 8 mm. long, these finely puberulent or in age glabrate; leaf blades oblanceolate-oblong or rarely oblong-obovate, 6 to 14.5 cm. long, 3 to 4.5 cm. wide, rounded at the apex, cuneate or rarely only obtuse at the base, subcoriaceous, green or grayish green on the upper surface and glabrous except along the puberulent veins, minutely puberulent beneath, especially along the veins, the midvein very prominent, the lateral veins 5 to 7 on each side, irregularly spaced, laxly anastomosing near the margin, the veinlets very numerous, prominent, and reticulated; flowers not known; fruit axillary, the pedicels solitary or fascicled, 5 to 15 mm. long, stout, puberulent; fruiting calyx 3.5 to 4 cm. broad, puberulent throughout or finally glabrate, lobed nearly to the base, the 5 (rarely 4) lobes ovate or oval-ovate, 6 to 10 mm. broad, acute or acutish, prominently veined; fruit depressed-globose, 8 to 10-celled, about 2.5 cm. in diameter, densely pubescent when young with short appressed hairs, glabrate in age; mature seeds not seen.

Type in the U. S. National Herbarium, no. 300363, collected at Acaponeta, Territorio de Tepic, Mexico, July 2 or 3, 1897, by J. N. Rose (no. 1522). Collected again by Dr. Rose near Acaponeta, July 29, 1897 (no. 3285).

Very probably to be referred here are specimens of fruit sold in the market at Mazatlán, Sinaloa (*Rose, Standley & Russell* 13981), under the name "guayaparín." The form of the calyx lobes suggests *Diospyros rosei*, but there are, of course, no leaves present. The fruit is black and nearly 4 cm. in diameter; the seeds are broadly oval to suborbicular in outline, 11 to 13 mm. long, 9 to 10 mm. wide, and 3 to 4 mm. thick, acute or acutish on the inner side, dark brown, and slightly roughened.

Diospyros rosei is closely related to *D. sonorae*. The calyx lobes, however, are of different form, being broadest below the middle and acute or acutish at the apex, rather than broadest above the middle and obtuse, as in the latter species; and the leaves are much more narrowed at the base, thinner, and on longer petioles.

Diospyros sonorae Standley, sp. nov.

Section Paralea. A small or large tree with stout thick trunk and rounded crown, the branches spreading; branchlets slender, gray, at first densely puberulent but glabrate in age; leaves persistent, alternate, the petioles stout, 2 to 3 or rarely 6 mm. long, puberulent; leaf blades oblong, narrowly oblong, or rarely oblanceolate-oblong, 5.5 to 13 cm. long, 2 to 4.2 cm. wide, rounded at the apex and sometimes emarginate, broadly rounded or obtuse at the base or sometimes obtusely cuneate, subcoriaceous, pale grayish green, glabrous on the upper surface, minutely puberulent beneath, at least when young, the midvein prominent beneath, slightly impressed above, the lateral veins 6 or 7 on each side, connected by numerous prominent reticulate veinlets; flowers not seen; fruit solitary or fascicled in the axils, on stout ligneous pedicels 12 to 15 mm. long; fruiting calyx 3 to 4 cm. broad, 5 (rarely 4-) lobed nearly to the base, the lobes oblong or elliptic-oblong, 5 to 11 mm. broad, broadest at or above the middle, obtuse or rounded at the apex, finely puberulent or glabrate, conspicuously veined; fruit depressed-globose, about 2.5 cm. in diameter, densely fulvous-puberulent when young, glabrate in age, 8-celled; seeds suboval in outline, 12 mm. long, 8 mm. broad, 6 mm. thick, blackish brown, cuneate in cross section, the inner edge very acute.

Type in the U. S. National Herbarium, no. 335774, collected at Alamos, Sonora, Mexico, December 27, 1898, by E. A. Goldman (no. 276).

ADDITIONAL SPECIMENS EXAMINED:

SONORA: Alamos, cultivated in the edge of town, March 10, 1910, *Rose, Standley & Russell* 12947. Two miles west of Hermosillo, cultivated, March 8, 1910, *Rose, Standley & Russell* 12543.

In spite of the absence of flowers there is little doubt that this species is referred correctly to the section Paralea. It is related probably to *D. guianensis* (Aubl.) Gürke (*D. paralea* Steud.), a native of the Guianas, Brazil, and Colombia, a species with subsessile fruit and broader, thinner, acute, deep green leaves. The Sonoran tree has been confused with *Diospyros ebenaster* Retz., a species which is probably native in Malaysia and is widely cultivated in tropical regions. At the beginning of the nineteenth century *D. ebenaster* was found growing at Cuernavaca, Mexico, doubtless cultivated. In the U. S. National Herbarium there are Mexican specimens from Cuernavaca (*Rose & Hough* 4435, *Pringle* 6992), La Junta, Chiapas (*Collins & Doyle* 14), and the vicinity of Guadalajara (*Safford* 1416, 1463). Pringle's no. 6992 was distributed as *D. ebeneum* Koen., but it is evidently not that species. *Diospyros ebenaster* is distinguished from *D. sonorae* by its very large, inconspicuously veined, glabrous leaves and larger fruit on short pedicels.

Diospyros sonorae appears to be known only in cultivation, but probably it is a native of the western slopes of the northern Sierra Madre. It is known at Hermosillo as "guayaparín," a name applied also to other species of this genus. The fruit is edible, but the black pulp is unattractive in appearance and insipid to the taste.

Diospyros sphaerantha Standley, sp. nov.

Section Paralea. Tree with deciduous leaves; branches dark gray, bearing numerous large, pale gray lenticels, the branchlets slender, fulvous-puberulent and sparsely strigillose with slender white hairs: leaves (immature) alternate, on petioles 4 to 5 mm. long, these strigillose and puberulent; leaf blades oblong or oblong-elliptic, 4.3 to 8 cm. long, 2 to 3.3 cm. wide, obtuse at the apex, obtuse or rounded at the base, thin, drying black, sparsely strigillose on both surfaces with very short slender whitish hairs, the veins only slightly prominent in the young leaves; pistillate flowers very numerous, axillary, solitary or fascicled, the slender pedicels 5 to 10 mm. long, densely fulvous-puberulent; calyx at anthesis 3 cm. in diameter, spreading, lobed nearly to the base, the 5 lobes ovate, narrowly ovate, or ovate-oval, 5 to 8 mm. broad, acute to acuminate, thin, densely puberulent outside the base and thinly pubescent upward, within puberulent at the base but glabrous toward the apex; corolla globose-urceolate, about 8 mm. in length and diameter, densely fulvous-tomentulose outside, the lobes rounded at the apex, glabrous within; ovary globose, densely tomentulose, the style 1 to 1.5 mm. long.

Type in the U. S. National Herbarium, no. 302159, collected in the foothills of the Sierra Madre near Colomas, Sinaloa, Mexico, July 13 to 20, 1897, by J. N. Rose (no. 3194).

Apparently *Diospyros sphaerantha* is closely related to *D. rosei* and at first the writer believed that the specimens represented a single species. In the latter species, however, the leaves are persistent, while in *D. sphaerantha* they are certainly deciduous. In the latter, too, the calyx lobes are not pubescent throughout and they are more acute. Furthermore, there is considerable difference in leaf outline. The proposed species is noteworthy because of the unusual development of the calyx at anthesis.

A NEW STYRAX FROM PANAMA.

There appeared a few years ago an elaborate monograph of the genus Styrax, by Miss Janet Perkins.[1] Specimens collected in Panama by Mr. Pittier, however, can not be referred to any of the Central American or Colombian species described in that work, and are accordingly here described as new.

Styrax panamensis Standley, sp. nov.

A tree, 8 to 10 meters high; branches terete, the older ones grayish, the young ones slender, densely covered with short fulvous stellate hairs; leaves alternate, the petioles stout, 6 to 16 mm. long, fulvous-tomentulose; leaf blades oval or oval-elliptic, 13 to 20 cm. long, 6 to 11 cm. wide, abruptly acuminate or attenuate at the apex, the acute tip 5 to 18 mm. long, rounded or rounded-cuneate at the base, chartaceous, entire, bright green and glabrate above in age, beneath densely covered with microscopic stellate gray hairs, the veins furnished with numerous coarser fulvous stellate hairs, the midvein stout, impressed above, the lateral veins 6 or 7 on each side, prominent beneath, impressed above, curvately joined near the margin, the veinlets conspicuously reticulate; inflorescence axillary, of numerous densely flowered panicles 3 to 4.5 cm. long, the rachis densely fulvous-tomentulose, the bracts and bractlets linear or subulate, densely stellate-tomentulose; flowers about 1 cm. long, on pedicels 3 to 8 mm. long; calyx cupuliform, about 4.5 mm. high and 4 mm. in diameter, densely fulvous-tomentulose outside, sparsely so within, the margin truncate, very obscurely 5-denticulate; corolla 5-parted, the tube 1 mm. long, the lobes valvate, 8 to 9 mm. long, 2 mm. wide, thick, densely covered outside with minute grayish appressed hairs, densely pubescent within; stamens 10, the free part of the filaments

[1] In Engl. Pflanzenreich 30: 1907.

plane, densely pubescent on the inner side, glabrous without, the anthers densely pilose on the margins; ovary densely pilose, the style glabrous, slightly longer than the stamens.

Type in the U. S. National Herbarium, no. 679343, collected in forests on Loma de la Gloria, near Fató, Province of Colón, Panama, altitude 10 to 104 meters, August, 1911, by H. Pittier (no. 4242).

Among the species treated in the monograph previously mentioned this appears to be nearest *S. bogotensis* Perkins,[1] described from the vicinity of Bogotá, Colombia. That species, however, has much smaller leaves (7 to 12 cm. long), shorter pedicels (2 to 3 mm.), and paniculate inflorescence.

Mr. Pittier collected another species of the genus, *Styrax argenteus* Presl, in the vicinity of Olá, Province of Coclé, Panama, early in December, 1911 (no. 5076). Miss Perkins in 1902 described another species, *S. warscewiczii*,[1] from Veraguas, Panama, the type being Warscewicz's no. 203.

TARDAVEL A VALID GENERIC NAME TO REPLACE BORRERIA.

It is evident that the name Borreria Meyer can not be applied to a genus of Rubiaceae, since it had been used previously by Acharius to designate a group of lichens, as stated by Meyer [2] when he dedicated the second genus to the lichenologist Borrer. The name Diodioides is the first synonym of Borreria cited by Dalla Torre and Harms.[3] This, however, was merely cited by Loefling [4] as a synonym, so is a nomen nudum. Tardavel was published by Adanson [5] in 1763. No specific name is cited, but there is a reference to plate 76 of Rheede's Hortus Indicus Malabaricus. This plate had been cited by Linnæus in the second edition of the Species Plantarum [6] under *Spermacoce hispida*. That plant thus becomes the type of the genus Tardavel. The generic name was taken up in 1898 by Hiern,[7] who transferred a number of species of Borreria to Tardavel..

The genus is a large one, numerous species occurring in tropical America. Only five, *Tardavel ocymoides* (Burm.) Hiern, and the following, have so far been found in Panama:

Tardavel laevis (Lam.) Standley.
Spermacoce laevis Lam. Tabl. Encycl. 1: 273. 1791.
Borreria laevis Griseb. Abh. Ges. Wiss. Göttingen 7: 231. 1857.

Tardavel latifolia (Aubl.) Standley.
Spermacoce latifolia Aubl. Pl. Guian. 1: *pl. 19. f. 1.* 1775.
Borreria latifolia Schum. in Mart. Fl. Bras. 6[6]: 61. 1888.

Tardavel spinosa (L.) Standley.
Spermacoce spinosa L. Sp. Pl. ed. 2. 148. 1762.
Borreria spinosa Schlecht. & Cham. Linnaea 3: 340. 1828.

Tardavel tenella (H. B. K.) Standley.
Spermacoce tenella H. B. K. Nov. Gen. & Sp. 3: 270. 1818.
Borreria tenella Schlecht. & Cham. Linnaea 3: 317. 1828.

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[1] Bot. Jahrb. Engler 31: 480.
[2] Prim. Fl. Esseq. 79. 1818.
[3] Gen. Siph. 506. 1900–1907.
[4] Iter Hisp. 201. 1759.
[5] Fam. Pl. 145. 1763.
[6] Page 149.
[7] Cat. Pl. Welw. 2: 503.

RESTORATION OF THE GENERIC NAME EVEA, WITH DESCRIPTIONS OF TWO NEW SPECIES.

The genus to which it is here proposed to restore the earliest name, Evea, has usually been known as Cephaelis or Uragoga, when it has been distinguished from Psychotria. The name Uragoga was used for it prior to 1753, but not afterwards until taken up by Baillon in 1880.[1] Cephaelis was published by Swartz in 1788.[2] In 1775 Aublet had published three generic names, Evea, Carapichea, and Tapogomea, all of which have always been referred to Cephaelis or Uragoga. Evea has priority of place in Aublet's Histoire des Plantes de la Guiane Française and consequently is the name to be adopted for the genus. The type species is *Evea guianensis* Aubl.

The following list of species includes all those known to occur in Panama. There are included descriptions of two new species, one from Panama and one from Colombia.

Evea axillaris (Swartz) Standley.
Cephaelis axillaris Swartz, Prodr. Veg. Ind. Occ. 45. 1788.
Tapogomea axillaris Poir. in Lam. Encycl. Suppl. 7: 585. 1806.

Evea elata (Swartz) Standley.
Cephaelis elata Swartz, Prodr. Veg. Ind. Occ. 45. 1788.
Cephaelis punicea Vahl, Eclog. Amer. 1: 19. 1796.
Cephaelis costaricensis Schlecht. Linnaea 28: 546. 1857.

Evea ipecacuanha (Brot.) Standley.
Calicocca ipecacuanha Brot. Trans. Linn. Soc. 6: 137. *pl. 11.* 1802.
Ipecacuanha officinalis Arruda, Diss. Pl. Braz. 44. 1810.
Collected in the vicinity of San Felix, eastern Chiriquí, Panama, at an altitude of 120 meters or less, by H. Pittier (no. 5271).
This plant furnishes the ipecac of commerce, which is exported in large quantities from northern South America and in small amounts from Panama. The Panama specimens are in fruit only, but seem to agree well with descriptions of the Brazilian plant, except that they are less pubescent.

Evea muscosa (Jacq.) Standley.
Morinda muscosa Jacq. Enum. Pl. Carib. 16. 1760.
Cephaelis muscosa Swartz, Prodr. Veg. Ind. Occ. 46. 1788.

Evea tomentosa (Aubl.) Standley.
Tapogomea tomentosa Aubl. Pl. Guian. 1: 160. *pl. 61.* 1775.
Cephaelis tomentosa Vahl, Eclog. Amer. 1: 19. 1796.

Evea campyloneuroides Standley, sp. nov.
Small tree; young branches stout, densely covered with loose slender whitish hairs; stipules united at the base, green, persistent, 15 to 18 mm. long, bilobate, the lobes lanceolate, long-attenuate, densely sericeous outside, glabrous within; petioles stout, 2 to 3 cm. long, densely pubescent like the stems; leaf blades oval or elliptic-oval, 14 to 18 cm. long, 5.5 to 7 cm. wide, abruptly acuminate or short-caudate, the tip 10 to 15 mm. long, acute or acuminate at the base, thin, deep green on the upper surface, slightly paler beneath, glabrous above except along the midvein, sericeous beneath

[1] Hist. Pl. 7: 280. [2] Prodr. Veg. Ind. Occ. 45.

along the veins with slender, loose, rather long, dirty white hairs, the lateral veins conspicuous, 27 to 32 on each side, parallel, anastomosing near the margin, finer secondary veins present between the primary ones and parallel with them, connected with the primary veins by fine transverse veinlets at regular intervals; peduncles terminal, 6 to 13 cm. long, very densely covered with long, fine, spreading, dirty white hairs; bracts orbicular-rhombic, 1 cm. long, apiculate, sericeous, green, each pair including 3 short-pedunculate heads 10 to 15 mm. in diameter, the inner peduncles 2 to 13 mm. long; bractlets green, oval-obovate, 10 mm. long, obtuse, apiculate, sericeous on both surfaces; calyx twice as long as the ovary, the two together 3 mm. long, densely sericeous, the lobes ovate, acute; corolla white, the slender tube about 7 mm. long, the lobes 2.5 mm. long, oblong, pubescent outside; fruit not seen.

Type in the U. S. National Herbarium, no. 530768, collected in sunny places in the forest near Córdoba, Dagua Valley, Pacific Coastal Zone, State of Cauca, Colombia, altitude 30 to 100 meters, December, 1905, by H. Pittier (no. 581).

Apparently not closely related to any other species; well distinguished by the form of the inflorescence and the abundant pubescence. The venation of the leaves is very similar to that found in ferns of the genus Campyloneurum.

Evea dichroa Standley, sp. nov.

Glabrous branched shrub 1.5 to 2 meters high; branches slender, nearly terete; stipules united at the base, green, persistent, 3 to 4 mm. long, deeply bilobate, the lobes oblong, obtuse; petioles slender, 1.5 to 2.5 cm. long; leaf blades elliptic or oblong-elliptic, 5.5 to 10.5 cm. long, 1.5 to 3.5 cm. wide, acuminate at the apex, acute or acuminate at the base, firmly herbaceous, bright green on the upper surface, slightly paler beneath, prominently veined, the lateral veins 9 to 12 on each side, parallel; peduncles terminal or rarely also axillary, 3 to 9 cm. long; bracts 15 to 20 mm. long, rounded-ovate, acutish, slightly united at the base, green or tinged with red or yellow, subtending 3 pedunculate heads, the peduncles 3 to 25 mm. long; each secondary head subtended by 2 orbicular-rhombic bracts 12 to 15 mm. long, these yellow or tinged with purple, each head consisting of 3 flowers, each flower subtended by an oblong-obovate acute bract 10 to 12 mm. long and an oblong-linear bracteole somewhat shorter; flowers sessile; calyx 3 mm. long, twice as long as the ovary, somewhat oblique, yellow, deeply 5-lobed, the lobes ovate to oblong, acute; corolla yellowish white, the tube 10 mm. long and 2 mm. in diameter, the 5 lobes 2.5 to 3 mm. long, oblong, obtuse; stamens included, inserted in the middle of the tube, the filaments about as long as the anthers, these linear, 2.5 mm. long; fruit not seen.

Type in the U. S. National Herbarium, no. 677615, collected in the humid forest of Cuesta de las Palmas, southern slope of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of 1,700 to 2,100 meters, March 17 to 19, 1911, by H. Pittier (no. 3218).

Known also from specimens collected in humid forest of Alto de las Palmas, southern slope of Cerro de la Horqueta, Chiriquí, altitude, 2,100 meters, *Pittier* 3266.

In the type collection the bracts are purple or greenish purple, more or less tinged with yellow, while in the second collection they are pale yellow or greenish yellow. The species seems very distinct in the form of the inflorescence, although some of the Brazilian species likewise have 3-parted heads.

DUGGENA AN OLDER NAME THAN GONZALAGUNIA.

There is a small genus of tropical American Rubiaceae which was long known under the name Gonzalea Pers. In recent years the name Gonzalagunia Ruiz & Pavon has generally been adopted for it, this name (1794) clearly having precedence over that of Persoon (1805). There seems no valid reason why the oldest generic name,

Duggena Vahl, published in 1793, should not be applied to the group. Its type is *Duggena richardii* Vahl, which apparently is a synonym of *D. spicata*, listed below.

Four species of the genus occur in Panama: *D. ovatifolia*, described from Costa Rica; *D. panamensis*, first characterized by Cavanilles in 1801 from specimens collected on Ancón Hill, Panama; *D. hayesii*, also described from Panama; and a fourth, collected recently by Mr. Pittier, which appears to be undescribed.

Duggena rudis Standley, sp. nov.

Branches slender, brownish, densely strigose with whitish tawny hairs; stipules 4 to 6 mm. long, triangular, with long filiform tips; leaves nearly sessile, the petioles 1 to 2 mm. long, the blades ovate or oblong-ovate, 35 to 55 mm. long, 14 to 24 mm. wide, rather abruptly acuminate, rounded at the base, thin, bright green, strigose on the upper surface, more densely pubescent beneath, especially along the veins, with appressed whitish hairs; racemes slender, 6 to 9 cm. long; flowers about 3 in each cluster, on very short peduncles; pedicels about 1 mm. long; bracts linear-subulate, 3 mm. long or less; corolla not seen; fruit 4-celled, depressed-globose, 2.5 mm. in diameter, densely hirsute; calyx lobes persistent, lance-linear, attenuate, nearly as long as the fruit, sparingly pubescent outside, glabrous within.

Type in the U. S. National Herbarium, no. 676602, collected in shady places along the Chagres River, near El Vigía, Panama, January 12, 1911, by H. Pittier (no. 2378).

Resembling *Duggena panamensis* in the 4-celled fruit, but readily distinguished by the small, nearly sessile leaves, narrow and longer calyx lobes, and densely pubescent fruit.

Duggena asperula (Wernham) Standley.

Gonzalea asperula Wernham, Journ. Bot. Brit. & For. **51**: 219. 1913.

Duggena brachyantha (A. Rich.) Standley.

Gonzalea brachyantha A. Rich. in Sagra, Hist. Cuba **11**: 16. 1850.
Gonzalagunia brachyantha Urban, Symb. Antill. **7**: 400. 1912.

Duggena bracteosa (Donn. Smith) Standley.

Gonzalea bracteosa Donn. Smith, Bot. Gaz. **33**: 252. 1902.
Gonzalagunia bracteosa Robinson, Proc. Amer. Acad. **45**: 405. 1910.

Duggena grisea (Wernham) Standley.

Gonzalea grisea Wernham, Journ. Bot. Brit. & For. **51**: 218. 1913.

Duggena hayesii (Wernham) Standley.

Gonzalea hayesii Wernham, Journ. Bot. Brit. & For. **51**: 219. 1913.

Duggena leptantha (A. Rich.) Standley.

Gonzalea leptantha A. Rich. in Sagra, Hist. Cuba **11**: 16. 1850.
Gonzalagunia leptantha Urban, Symb. Antill. **7**: 400. 1912.

Duggena mollis (Spruce) Standley.

Gonzalagunia mollis Spruce; Schum. in Mart. Fl. Bras. **6**[6]: 290. 1889.
Gonzalea mollis Spruce; Schum. in Mart. Fl. Bras. **6**[6]: 291. 1889, as synonym; Wernham, Journ. Bot. Brit. & For. **51**: 219. 1913.

The type collection is the same in both places of publication cited above; Mr. Wernham, however, makes no reference to the earlier publication of the species by Schumann.

Duggena nivea (Bartling) Standley.

Gonzalea nivea Bartling; DC. Prodr. **4**: 436. 1830.
Gonzalagunia nivea Kuntze, Rev. Gen. Pl. **1**: 284. 1891.

Duggena ovatifolia (Donn. Smith) Standley.
Gonzalea ovatifolia Donn. Smith, Bot. Gaz. **27**: 336 1899.
Gonzalagunia ovatifolia Robinson, Proc. Amer. Acad. **45**: 405. 1910.

Duggena panamensis (Cav.) Standley.
Buena panamensis Cav. Icon. Pl. **6**: 50. *pl. 571.* 1801.
Gonzalea panamensis Pers. Syn. Pl. **1**: 133. 1805.

Duggena petesia (Griseb.) Standley.
Gonzalea petesia Griseb. Mem. Amer. Acad. n. ser. **8**: 504. 1863.
Gonzalagunia petesia Robinson, Proc. Amer. Acad. **45**: 405. 1910.

Duggena pulverulenta (Humb. & Bonpl.) Standley.
Gonzalea pulverulenta Humb. & Bonpl. Pl. Aequin. **1**: 228. 1808.
Gonzalagunia pulverulenta Kuntze, Rev. Gen. Pl. **1**: 284. 1891.

Duggena rugosa Standley.
Gonzalagunia rugosa Standley, Contr. U. S. Nat. Herb. **17**: 446. 1914.

Duggena sagraeana (Urban) Standley.
Gonzalagunia sagraeana Urban, Symb. Antill. **7**: 399. 1912.

Duggena spicata (Lam.) Standley.
Lygistum spicatum Lam. Tabl. Encycl. **1**: 286. 1791.
Gonzalea spicata DC. Prodr. **4**: 437. 1830.

Duggena thyrsoidea (Donn. Smith) Standley.
Gonzalea thyrsoidea Donn. Smith, Bot. Gaz. **13**: 188. 1888.
Gonzalagunia thyrsoidea Robinson, Proc. Amer. Acad. **45**: 405. 1910.

Duggena tomentosa (Humb. & Bonpl.) Standley.
Gonzalea tomentosa Humb. & Bonpl. Pl. Aequin. **1**: 225. *pl. 64.* 1808.
Gonzalagunia tomentosa Kuntze, Rev. Gen. Pl. **1**: 284. 1891.

NEW OR NOTABLE SPECIES OF ARCYTOPHYLLUM.

The genus Arcytophyllum, a member of the Rubiaceae, is represented by some 20 species, confined chiefly to the high mountains of northern South America. Several species are contained in the recent collections of Mr. Pittier in Colombia and Venezuela, two of which are undescribed. The species found in Costa Rica and Panama was given a manuscript name several years ago by Dr. Schumann, but this has never been formally published. A diagnosis of it is given in the present paper. There are included also transfers of 4 species previously published under other generic names.

Arcytophyllum capitatum (Benth.) Standley.
Rhachicallis capitata Benth. Pl. Hartw. 195. 1845.
Hedyotis capitata Walp. Repert. Bot. **6**: 56. 1846, not Lam.
Hedyotis hartwegiana Wedd. Chlor. And. **2**: 45. 1857.
Collected by Hartweg (no. 1070) in the Province of Popayán, Colombia.

Arcytophyllum carcasanum (H. B. K.) Standley.
Hedyotis caracasana H. B. K. Nov. Gen. & Sp. **3**: 393. 1818.
Rachicallis caracasana DC. Prodr. **4**: 434. 1830.
First found by Bonpland on the Silla de Caracas, Venezuela, and collected by Otto Kuntze at the same locality in 1874. The species was collected by Mr. H. Pittier (no. 6237) in the upper belt of Pico de Naiguatá, State of Miranda, Venezuela, on the southern slope at an altitude of 2,400 to 2,765 meters, in May, 1913. Here, too, appar-

ently, belong specimens collected by Pittier (no. 1114) in the Páramo de Buena Vista, Huila Group, Central Cordillera, State of Cauca, Colombia, at an altitude of 3,000 to 3,600 meters. The Colombian plant has rather narrower leaves than the Venezuelan one but does not seem to differ otherwise.

Arcytophyllum caucanum Standley, sp. nov.

Low, much branched shrub, 20 to 30 cm. high; branches stout, quadrangular, glabrous, or scabro-ciliate along the angles, erect or strongly ascending; leaves numerous, crowded; stipules broadly ovate, divided into several bristle-like laciniæ at the apex; leaf blades 6 mm. long and 3 mm. wide, oval, obtuse or acutish, mucronulate, nearly flat, margined, thick and coriaceous, glabrous, abruptly contracted at the base into a very short petiole; flowers short-pediceled, in subsessile few-flowered terminal clusters; pedicels glabrous; calyx 4 to 5 mm. long, the lobes triangular-oblong, acute or acuminate, much longer than the tube, with intermediate setose appendages nearly as long as the lobes; corolla tube 5 to 7 mm. long, much exceeding the lobes, these triangular-ovate, acute, pilose within with fine short hairs; capsule about 2 mm. high.

Type in the U. S. National Herbarium, no. 531334, collected in the Páramo de Buena Vista, Huila Group, Central Cordillera, State of Cauca, Colombia, at an altitude of 3,000 to 3,600 meters, January, 1906, by H. Pittier (no. 1137). Also collected in the Páramo de Moras, between Mozoco and Pitayó, in the same State, at a similar altitude, February, 1906, by Mr. Pittier (no. 1412).

Related to *A. capitatum* but differing in the smaller, less acute leaves, the larger flowers which surpass the leaves, and the proportionally longer corolla tube.

Arcytophyllum cephalanthum (Wedd.) Standley.

Hedyotis cephalantha Wedd. Chlor. And. **2**: 46. 1857.

This was based by Weddell upon three collections from the provinces of Pamplona and Ocaña, Colombia. Weddell states that it is perhaps the largest of the species, the leaves being often 2 cm. long.

Arcytophyllum latifolium Standley, sp. nov.

Low shrub; stems erect, branched, stout, glabrous, yellowish, obtusely quadrangular; leaves numerous but scarcely crowded; leaf blades 10 to 14 mm. long, 5 to 8 mm. wide, broadly ovate or ovate-oblong, broadly obtuse, mucronulate, glabrous, thick and coriaceous, the margins usually strongly revolute, abruptly contracted at the base into a very short petiole; stipules broadly ovate, rounded at the apex and dissected into setose laciniæ, scarious, stramineous, conspicuous; flowers nearly sessile in dense few-flowered terminal clusters; calyx 3 mm. long, the lobes lanceolate or lance-oblong, acute, twice as long as the tube or more, with intermediate setose appendages much shorter than the lobes; flowers surpassing the leaves; corolla tube 3 to 4 mm. long, only slightly longer than the ovate acutish lobes, these abundantly pubescent within with short, white, very coarse hairs; capsules not seen.

Type in the U. S. National Herbarium, no. 531356, collected in the Páramo de Buena Vista, Huila Group, Central Cordillera, State of Cauca, Colombia, at an altitude of 3,000 to 3,600 meters, January, 1906, by H. Pittier (no. 1159).

Nearest *A. capitatum* and *A. caucanum;* differing from the former in its smaller obtuse leaves and larger flowers, and from the latter in the broader, more obtuse leaves with revolute margins and in the shorter corolla tube. The pubescence of the corolla is very different in *A. caucanum* and *A. latifolium.*

Arcytophyllum lavarum Schum. sp. nov.

Mallostoma lavarum Donn. Smith, Enum. Pl. Guat. **5**: 36. 1899, hyponym.

Arcytophyllum lavarum Schum. loc. cit. as synonym.

Low, much branched shrub, 12 to 25 cm. high; branches stout, erect, glabrous, quadrangular; leaves numerous, dense; stipules about 1 mm. long, triangular-ovate, acuminate, papillose on the outer surface or smooth, with usually 2 laciniæ on each

side near the apex; leaves 4 to 6 mm. long, 2 to 3 mm. wide, oblong to oblong-ovate or oval, obtuse or rounded at the apex, thick and coriaceous, glabrous, flat or nearly so, shining on the upper surface, abruptly contracted at the base into a very short petiole; flowers few, short-pediceled, in solitary or clustered, pedunculate, terminal cymes; pedicels glabrous; calyx 2 mm. long, glabrous, thick and firm, the lobes oblong to oval or ovate, obtuse or acutish, longer than the tube, with low and inconspicuous intermediate lobes; corolla tube 3.5 mm. long, much longer than the lobes, these densely pilose within with coarse white hairs; capsule 2 mm. long.

Type in the U. S. National Herbarium, no. 675707, collected on bare rock slopes at the summit of Chiriquí Volcano, Panama, at an altitude of 3,374 meters, March 12, 1911, by William R. Maxon (no. 5349).

ADDITIONAL SPECIMENS EXAMINED:

PANAMA: Volcán de Chiriquí, April, 1899, *K. Sapper*.

COSTA RICA: Volcán de Poás, Province of Alajuela, alt. 2,700 meters, *J. D. Smith* 6635. Volcán de Turrialba, Province of Cartago, alt. 2,800 meters, *Pittier* (J. D. Smith, no. 7506; Inst. Fís. Geogr. Costa Rica, no. 13239).

Related to *A. hartwegianum* and *A. cephalanthum*, of Colombia, by its pubescent corollas, but readily distinguished by its small, obtuse leaves and loose inflorescence. Only one other species of the genus is known from Central America, *A. shannoni*, described from Guatemala.

Arcytophyllum shannoni (Donn. Smith) Standley.

Mallostoma shannoni Donn. Smith, Bot. Gaz. 18: 203. 1893.

NEW SPECIES OF PSYCHOTRIA FROM PANAMA.

Psychotria is represented in Panama by a larger number of species than any other genus of the Rubiaceae. At present 26 species are known from the region, but when remote parts of the country are explored this number will doubtless be greatly increased. An excellent account of the West Indian Psychotrias by Dr. Urban has appeared recently,[1] which has been of great service in the study of the Panamanian species. Most of the forms found in Panama are confined, so far as known, to continental North America, and probably many of them are endemic.

Psychotria aggregata Standley, sp. nov.

Branches stout, succulent, glabrous, lineolate; stipules united at the base, green, each abruptly contracted into a narrowly oblong tip 3 mm. long; petioles 3 to 3.5 cm. long; leaf blades oblanceolate, 12 to 20 cm. long, 3 to 5 cm. wide, acuminate, attenuate at the base, subcoriaceous, glabrous, dull green on the upper surface, whitish beneath, prominently veined, the veins coarse, white beneath; peduncles axillary, 4 to 5 cm. long, minutely puberulent, bearing mostly 3 pedunculate, densely many-flowered heads, the heads composed of few-flowered fascicles each subtended by several narrowly oblong to ovate, acute or acutish, ciliolate, green bracts, these equaling or slightly exceeding the calyces; calyx and ovary subequal in length, together 3 mm. long, the calyx lobed to the middle, whitish, the lobes ovate, obtuse or acutish, minutely and sparsely puberulent; corolla white, 4 mm. long, puberulent outside, the tube dilated upward, the lobes very short, hooded; fruit not seen.

Type in the U. S. National Herbarium, no. 677655, collected in the humid forest between Alto de las Palmas and top of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of 2,100 to 2,260 meters, March 18, 1911, by H. Pittier (no. 3264).

[1] Urban, Symb. Antill. 7: 433–477. 1913.

Readily distinguished from the other species with axillary inflorescence by its numerous small, densely clustered flowers, large green bracts, whitish calyx, and conspicuously hooded corolla lobes.

Psychotria calophylla Standley, sp. nov.

Young branches stout, obtusely angled, short-villous with short soft spreading multicellular ferruginous hairs; stipules not seen, deciduous; petioles stout, 1 to 2.5 cm. long, pubescent like the branches; leaf blades broadly obovate or rounded-obovate, 16 to 22 cm. long, 7.5 to 12 cm. wide, rounded at the apex and short-apiculate, the apex broadly triangular, acute or acutish, rather abruptly long-acuminate or attenuate at the base, firmly herbaceous, glabrous on the upper surface, densely pubescent beneath along the veins with short soft ferruginous hairs, softly ferrugino-puberulent between the veins, the veins conspicuous beneath but slender, 11 to 13 lateral ones on each side; inflorescence sessile, 7 cm. long, and about 12 cm. wide, loosely branched, the branches short, spreading or divaricate, densely short-villous with ferruginous hairs; flowers sessile, capitate at the ends of the branches; ovary and calyx together 3.5 to 5 mm. long, densely ferrugino-pubescent with short soft fine multicellular hairs, the calyx limb shallowly and obtusely lobed; corolla not seen; fruit sharply 12-costate, about 12 mm. long, the seeds not sulcate on the inner surface.

Type in the U. S. National Herbarium, no. 48568, collected in the vicinity of Chagres, Isthmus of Panama, March 15, 1850, by August Fendler (no. 60). Duplicate in the Gray Herbarium.

Well marked by the large, broad leaves, soft, ferruginous pubescence, sessile inflorescence, and large fruit.

Psychotria chiriquina Standley, sp. nov.

Shrub 3 meters high, glabrous throughout; branches stout, succulent, densely leafy, the internodes 4 to 10 mm. long; stipules 6 mm. long, oblong-ovate, obtuse, united only at the base, reddish brown, early deciduous; petioles stout, 3 to 6 mm. long; leaf blades elliptic or oblong-elliptic, 4.5 to 6.5 cm. long, 1 to 2 cm. wide, acuminate to an obtuse tip, acuminate at the base, subcoriaceous, rather pale green, the veins not prominent; peduncles 2 to 2.5 cm. long, terminal, bearing a trichotomous corymb 2 to 3.5 cm. long; pedicels 2 to 3 mm. long, stout; bracts rounded-ovate, 1 mm. long; calyx 1 mm. long, the limb subentire; corolla white, 5 mm. long, the tube stout, the lobes oblong, obtuse, leathery, one-third to half as long as the tube, appendaged outside below the apex, spreading, densely bearded in the throat; anthers oblong, nearly sessile; style glabrous; fruit not seen.

Type in the U. S. National Herbarium, no. 677509, collected on Alto de la Cuesta, eastern slope of Chiriquí Volcano, Panama, at an altitude of 2,100 to 2,200 meters, March 10 to 13, 1911, by H. Pittier (no. 3118).

Remarkable for the densely leafy branches, firm leaves, and subentire calyx.

Psychotria fendleri Standley, sp. nov.

Branches stout, nearly terete, glabrous; stipules united only at the base, broadly ovate to oblong, 7 to 9 mm. long, entire, obtuse, brown, soon deciduous, glabrous; petioles very stout, 2 to 5 mm. long; leaf blades broadly obovate to oval-obovate, 5 to 9 cm. long, 2.5 to 5 cm. wide, rounded at the apex and very broadly apiculate, the apex obtuse or abruptly acutish, acute or broadly cuneate at the base, coriaceous, glabrous, pale green, the margins often revolute, the veins conspicuous beneath, the lateral ones 7 to 9 on each side; peduncles terminal, 3.5 to 4 cm. long, stout, glabrous, the primary branches of the inflorescence 3 to 5, about 7 mm. long, each bearing several short-pedunculate clusters of sessile or short-pedicellate flowers; bracts subtending the primary branches of the inflorescence 5 to 6 mm. long, lance-oblong, acute, thin, brown; calyx and ovary glabrous, together 2.5 mm. long, the calyx shallowly and

broadly dentate; corolla 5 mm. long, glabrous outside, the lobes shorter than the tube, oblong, obtuse; fruit not seen.

Type in the U. S. National Herbarium, no. 48567, collected in the vicinity of Chagres, Panama, February 25, 1850, by August Fendler (no. 59). Duplicate in the Gray Herbarium.

Here also belongs a specimen from the region of Santa Marta, Colombia, at an altitude of 600 meters, collected by Herbert H. Smith (no. 1832). In this some of the leaves are as much as 11.5 cm. long, the inflorescence is more open and much branched, 5 to 7 cm. long, and the corolla is densely villous in the throat. The Colombian collection was distributed as *Psychotria granadensis* Benth., a species originally described from Nicaragua, but that is characterized as having shorter stipules, much longer, narrower leaves, subsessile inflorescence, and longer corolla lobes.

Psychotria goldmanii Standley, sp. nov.

Shrub; branches slender, subterete, glabrous; stipules united, green, firm, persistent, bilobate, the lobes short, lance-subulate; petioles slender, 3 to 8 mm. long; leaf blades elliptic to elliptic-oblong, 3.5 to 8 cm. long, 0.8 to 1.5 cm. wide, abruptly long-attenuate, the tip nearly linear, 5 to 12 mm. long, obtuse, acuminate, or cuneate at the base, firmly herbaceous, deep green and glabrous on the upper surface, pale beneath and sometimes puberulent along the veins, these conspicuous, the lateral ones parallel, with finer veins between them; inflorescence terminal, the slender peduncles about 2 cm. long, bearing a corymbose panicle 2.5 to 3 cm. high and of about the same breadth, the branches ascending, sparsely puberulent; flowers sessile or subsessile, clustered at the ends of the peduncles, each cluster subtended by 2 connate ovate acute bracts, the bracts subtending the branches of the inflorescence linear, 2 to 4 mm. long; calyx longer than the ovary, the lobes shorter than the tube, ovate to oblong, obtuse or acute; corolla 5 mm. long, glabrous outside, the tube dilated above the middle, the lobes scarcely 1 mm. long, obtuse, erect; fruit 4 mm. high, compressed, conspicuously costate, glabrous.

Type in the U. S. National Herbarium, no. 716141, collected at the head of Río Limón, Mount Pírre, Province of Panama, Panama, at an altitude of 1,500 meters, March 6, 1912, by E. A. Goldman (no. 1883).

Very distinct in the pale lower surface of the leaves and the short corolla lobes. In general appearance the plant resembles the Brazilian *Psychotria leiocarpa*.

Psychotria insignis Standley, sp. nov.

Branches woody, the young ones stout, obtusely angled, densely short-pubescent with dark ferruginous spreading hairs; stipules distinct, soon deciduous, 1.5 cm. long, oblong, acutish, thin, densely short-pubescent outside; petioles 2.5 to 5 cm. long, stout; leaf blades ovate to oblong or oval, 14 to 22 cm. long, 7 to 9 cm. wide, gradually acuminate, cordate or subcordate at the base, herbaceous, glabrous on the upper surface except along the midvein, there short-pubescent, densely short-pubescent beneath along the veins with rigid spreading ferruginous hairs, very finely pubescent elsewhere, prominently veined beneath, the lateral veins 17 to 20 on each side, parallel, arcuate, anastomosing to form a vein near the margin; inflorescence terminal, sessile, 5-rayed at the base, each branch bearing 3 or more peduncled heads of sessile flowers, the branches densely pubescent with short spreading ferruginous hairs; flowers numerous in each head; calyx 2 mm. long, 5-lobed to the middle, the lobes oblong, obtuse or rounded at the apex, densely pubescent outside; ovary shorter than the calyx, densely covered with short soft ferruginous hairs; mature corollas not seen, those in bud pubescent outside with short stiff white hairs; fruit not seen.

Type in the U. S. National Herbarium, no. 679567, collected on the hills of Sperdi, near Puerto Obaldía, San Blas Coast, Panama, at an altitude of 20 to 200 meters, September, 1911, by H. Pittier (no. 4410).

Remarkable for the large, obtuse calyx lobes, and especially for the cordate leaves.

Psychotria albonervia Standley, sp. nov.

Shrub; young branches stout, obscurely angled, green, glabrous; stipules distinct, 12 to 17 mm. long, 6 to 8 mm. wide, coriaceous, green tinged with purple, conspicuously parallel-veined, soon deciduous, each 2-lobed to the middle, the lobes narrowly lanceolate, acuminate, ciliolate; petioles 5 to 15 mm. long, stout, leaf blades narrowly oblong-oval to elliptic-oblong or rarely obovate, 10 to 16 cm. long, 2.5 to 6 cm. wide, abruptly acuminate or attenuate, obtuse and somewhat decurrent to cuneate at the base, coriaceous, bright green, shining, and glabrous on the upper surface, beneath paler, glabrous except along the veins, these very conspicuous, broad, white, minutely ciliolate, the lateral ones 17 to 25 on each side, parallel, anastomosing to form an irregular marginal vein; peduncles terminal, 3 to 5.5 cm. long, glabrous, the inflorescence thyrsoid-paniculate, 3 to 6 cm. long, 3 to 5.5 cm. wide, the main branches verticillate, divaricate, stout, sparsely pubescent with short spreading white hairs; flowers clustered at the ends of the peduncles, sessile or subsessile; bracts whitish, 6 to 8 mm. long, lanceolate to oblong or oval, obtuse or acutish, ciliolate, prominently veined; calyx very short, the teeth triangular, acute; corolla 8 to 10 mm. long, white, glabrous outside, villous within near the base, the tube 1.5 to 2 mm. in diameter, the lobes oblong to broadly ovate, half as long as the tube, obtuse or acutish; filaments elongate, the anthers exserted; fruit not seen.

Type in the U. S. National Herbarium, no. 47282, collected in the vicinity of Chagres, Panama, in February or March, 1850, by August Fendler (no. 62). Another specimen of the same collection is in the Gray Herbarium.

Also collected in the Sabana de Marcelito near El Vigía, Panama, on edge of forest, January 12, 1911 (*Pittier* 2379).

This finds its nearest ally in *Psychotria arcuata* Benth.,[1] described from British Guiana, but occurring also in Grenada, Tobago, and Trinidad, according to Urban,[2] and in Brazil, according to Schumann.[3] Schumann considers *P. arcuata* a synonym of *P. inundata* Benth., published at the same time, but specimens of the type collections in the U. S. National Herbarium appear to represent distinct species. *Psychotria arcuata* is distinguished from the Panamanian species here proposed as new by the very different persistent stipules and the thinner, smaller leaves.

Psychotria magna Standley, sp. nov.

A shrub 3 meters high; young branches stout, obtusely angled, minutely puberulent or glabrate; stipules not seen, evidently soon deciduous; petioles stout, 2 to 4 cm. long, glabrous; leaf blades oval or elliptic-oval, 18 to 25 cm. long, 8 to 11.5 cm. wide, abruptly caudate or attenuate from an obtuse apex, the tip narrowly triangular, 2 to 3 cm. long, obtuse or broadly cuneate at the base, herbaceous, drying dark brown, glabrous, or very minutely puberulent on the veins beneath, the lateral veins prominent, 17 to 20 on each side, parallel, scarcely anastomosing at the margin; inflorescence terminal, cymose-paniculate, sessile, about 10 cm. long and broad, much branched, the branches spreading, very minutely puberulent; flowers sessile, capitate at the ends of the peduncles; no bracts seen; calyx and ovary together 1.5 mm. long, the limb of the calyx undulate, ciliolate; corolla yellowish white, 3 to 4 mm. long, glabrous outside, densely white-villous within, the tube thick, the lobes as long as the tube, oblong or ovate-oblong, obtuse or acutish, spreading; filaments stout, elongate, the anthers exserted; fruit not seen.

Type in the U. S. National Herbarium, no. 679188, collected in forests, Loma de la Gloria, near Fató, Province of Colón, Panama, at an altitude of 10 to 100 meters, August, 1911, by H. Pittier (no. 4092).

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[1] Journ. Bot. Hook. 3: 229. 1841.

[2] Symb. Antill. 7: 475. 1913.

[3] In Mart. Fl. Bras. 6[5]: 310. 1881.

Without stipules and fruit it is impossible to determine the true position of this plant, but it seems to be different from all the species ascribed to Central America or northern South America. It is well distinguished by the very large, caudate leaves.

Psychotria panamensis Standley, sp. nov.

Small tree with glabrous leaves and branches; stipules 4 to 6 mm. long, united only at the base, broadly ovate or oval, entire, obtuse, thick and leathery, deciduous, short-pubescent on the inner surface near the margins; petioles 1 to 2 cm. long; leaf blades obovate to obovate-oblong, rarely ovate, 5.5 to 10 cm. long, 2 to 4 cm. wide, obtuse or rarely acutish, firmly herbaceous, dull green, rather prominently veined beneath; peduncles 1 to 1.5 cm. long, stout, the inflorescence corymbose-paniculate, 4 to 5.5 cm. long, many-flowered, the branches minutely puberulent; flowers capitate at the ends of the branches, subsessile before anthesis, but the stout pedicels in fruit 3 to 4 mm. long; bracts early deciduous; calyx 1.5 mm. long and fully as broad, the limb subentire, ciliolate; developed corollas not seen, those in bud glabrous outside; fruit globose, 7 mm. high, obtusely costate, glabrous; seeds 5 mm. long, smooth, not sulcate on the inner surface.

Type in the U. S. National Herbarium, no. 677588, collected in the humid forest around Los Siguas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of 1,700 meters, March 17 to 19, 1911, by H. Pittier (no. 3194).

Related, apparently, to *Psychotria carthaginensis*, but distinguished by the large fruit, longer petioles, and obtuse leaves.

Psychotria peperomiae Standley, sp. nov.

A low shrub, glabrous throughout; stems stout, the younger ones succulent, branched, terete or obtusely angled; stipules 2 mm. long, united to form a truncate sheath, the margin marcescent; petioles 4 to 6 mm. long; leaf blades broadly obovate to obovate-oval, 2.5 to 5 cm. long, 1 to 2.5 cm. wide, obtuse or rounded at the apex, apiculate, the tip 1 to 2 mm. long, acute or cuneate at the base, fleshy, inconspicuously veined; peduncles chiefly terminal, 1 to 2.5 cm. long, slender, bearing a loosely few-flowered corymbose inflorescence; bracts linear, attenuate, brownish, 2 to 3 mm. long; pedicels 2 to 5 mm. long, slender; calyx 1 mm. long, the 4 lobes longer than the tube, ovate-triangular, acute; corolla 5 mm. long, the tube slightly dilated above, the lobes oblong or broadly oblong, about one-third as long as the tube, their tips incurved, the throat glabrous within; anthers nearly sessile, inserted in the throat of the corolla; fruit subglobose, 3 mm. high, nearly smooth.

Type in the U. S. National Herbarium, no. 677632, collected in the humid forest on the top of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of 2,265 meters, March 18, 1911, by H. Pittier (no. 3235).

In general form and in the tetramerous flowers most closely related to *Psychotria crassa* Benth.[1] That species differs in the larger, acuminate leaves, bearded throat of the corolla, and longer corolla lobes.

Psychotria pittieri Standley, sp. nov.

Shrub; young branches slender, densely pubescent with rather long, coarse, white, appressed or spreading hairs; stipules 4 to 6 mm. long, united at the base, bilobate, the lobes linear-subulate; petioles 3 to 5 mm. long, slender, pubescent like the branches; leaf blades elliptic-oval, 4 to 5.5 cm. long, 1.5 to 2.5 cm. wide, abruptly acuminate or attenuate, the tip acute, obtuse to cuneate at the base, herbaceous, deep green on the upper surface except along the midvein, there hirsutulous, pale beneath and finely pubescent with short appressed hairs, conspicuously veined, the lateral veins parallel with many finer veins between them; peduncles terminal, 1.5 cm. long, slender, densely covered with soft white hairs, bearing few-flowered panicles about 2 cm. long; flowers clustered at the ends of the branches, subsessile; bracts small, linear; calyx 1

[1] Journ. Bot. Hook. 3: 227. 1841.

mm. long, densely appressed-pubescent with white hairs, the lobes rounded-ovate, obtuse; corolla white, 4 to 5 mm. long, appressed-pubescent outside, the lobes triangular-oblong, acute, about as long as the tube, spreading; fruit not seen.

Type in the U. S. National Herbarium, no. 676523, collected in forest between Gorgona and Gatún, Canal Zone, Panama, at an altitude of 10 to 50 meters, January 7, 1911, by H. Pittier (no. 2266).

Peculiar in the long whitish pubescence of the stems and inflorescence, the appressed pubescence of the leaves, and the short, oblong inflorescence.

Psychotria psychotriaefolia (Seem.) Standley.

Cephaelis psychotriaefolia Seem. Bot. Voy. Herald 138. 1852–7.

TYPE LOCALITY: "In dense forests near Cruces, Province of Panama, and Chirambira, Darien."

DISTRIBUTION: Panama.

Shrub; young branches and inflorescence ferrugino-tomentulose; stipules united, thin, brown, deciduous, 1.5 to 2 cm. long, abruptly long-attenuate, ciliate, the apex usually bifid; leaf blades very shortly petiolate, obovate to obovate-oblong, 9 to 17 cm. long, acute or short-acuminate, cuneate at the base, glabrous above, puberulent beneath, at least along the veins; inflorescence axillary or rarely terminal, sessile, the branches 1 to 6, 2 cm. long or less, each bearing 1 or several heads of sessile flowers, each head subtended by several more or less united bracts; corolla 3 mm. long; fruit 4 to 5 mm. long, glabrous.

PANAMA: Without locality, *Seemann* (Gray Herb.). Chagres, *Fendler* 58. Gatún, *Hayes* (Gray Herb.).

Several sheets of some of the above collections have been examined. They do not agree in all respects with the original description, especially in the axillary inflorescence. It seems probable, however, that Seemann described the species from young material, which might account for some of the discrepancies.

NEW SPECIES OF RUBIACEAE OF SEVERAL GENERA, CHIEFLY FROM PANAMA.

The species described below are chiefly based upon the collections made in Panama, but a few are from other parts of tropical America. Two of the species, *Cassupa panamensis* and *Stachyarrhena heterochroa*, are of particular interest because they represent genera not previously reported from North America.

Basanacantha subcordata Standley, sp. nov.

Shrub or small tree with sweet-scented white flowers; branches slender, divaricate, glabrous, each bearing near the apex 2 slender or stout spines 5 to 7 mm. long; stipules free, 6 to 8 mm. long, ovate to oblong, obtuse or acute, mucronate, glabrous outside, densely white-sericeous within; petioles slender, 10 to 25 mm. long, canescent; leaf blades thin, dull green, oblong to ovate or broadly oval-ovate, 4 to 10 cm. long, 2.5 to 6 cm. wide, very unequal, acute or abruptly acute, rarely obtuse, with a subulate tip 1 to 2 mm. long, from rounded to cordate at the base, somewhat decurrent upon the petiole, strigillose or scaberulous on the upper surface, abundantly strigose and scabrous beneath; staminate flowers 2 or more together at the end of the branches, sessile, the calyx tubular-campanulate, 7 mm. high, with 5 subulate lobes about 5 mm. long, abundantly pubescent, with long whitish appressed hairs; corolla tube 5 to 6 cm. long, slender, abundantly hirtellous outside, the lobes 2.5 to 4 cm. long, ovate or lanceolate, attenuate, sparingly pubescent; anthers slightly exserted; pistillate flowers solitary at the ends of the branches; ovary densely tomentose, the calyx tube tubular-campanulate, 6 mm. long, densely pubescent with whitish hairs, the lobes linear,

15 to 18 mm. long, acuminate to a subulate tip, narrowed toward the base, sparingly pubescent; corolla tube 45 mm. long, scabro-hirtellous; fruit not seen.

Type in the U. S. National Herbarium, no. 861251, collected in thickets and along roadsides near Nicoya, Costa Rica, May, 1900, by A. Tonduz (Inst. Fis. Geogr. Costa Rica, no. 13934). The specimens on this sheet bear staminate flowers. The description of the pistillate flowers is based upon a specimen mounted on sheet 474620, collected near Las Huacas, Nicoya Peninsula, Costa Rica, altitude 900 meters, May 24, 1903, by O. F. Cook and C. B. Doyle (no. 724).

The only closely related species described from Central America is *Basanacantha monantha* (Benth.) Hook. f., the type locality of which is Guatemala. That has thickish, differently shaped leaves, and a very different calyx and corolla. The native name of the Costa Rican plant is "crucilla."

Basanacantha pitteri Standley, sp. nov.

Branches stout, spreading, glabrous, grayish brown, with numerous light-colored lenticels; stipules distinct, broadly ovate, acutish, thin, brown, glabrous outside, densely silky-pilose within with white hairs; petioles stout, 9 to 14 mm. long, densely pubescent with stiff stout spreading tawny hairs; leaf blades broadly obovate or oval, 12 to 46 cm. long, 7 to 10 cm. wide, abruptly acute, with a subulate tip 1 to 2 mm. long, rounded at the base, thin, dull green, loosely strigose above, slightly paler beneath and densely pubescent with long slender stiff loose hairs; only staminate flowers seen, these few together at the ends of the branches; calyx tube campanulate, 4 mm. long, the lobes subulate, of about the same length, the whole calyx glabrous except for a few long slender white hairs on the lobes and about the margin of the tube; corolla white, the tube 6 cm. long, slender, slightly dilated in the throat, glabrous outside, villous within, the lobes lanceolate or elliptic-lanceolate, 25 to 30 mm. long, long-attenuate; anthers linear, sessile in the throat of the corolla, 1 cm. long; style slender, 45 mm. long, glabrous.

Type in the U. S. National Herbarium, no. 578473, collected at Zent Junction, near Matina, Costa Rica, February, 1900, by H. Pittier (Inst. Fis. Geogr. Costa Rica, no. 16036).

There is a well developed style present in all of the flowers, but it appears to be abortive, and the form of the calyx and the sterile ovary shows very plainly that the flowers are not fertile. In general appearance *B. pittieri* is similar to the preceding species, but it differs conspicuously in the nearly glabrous calyx, glabrous corolla, larger, broader leaves, and short petioles.

Basanacantha lasiantha Standley, sp. nov.

Branches rather slender, glabrous, divaricately branched, each bearing near the end 2 short stout spines 6 mm. long; stipules distinct, 6 to 8 mm. long, ovate or ovate-oblong, obtuse, glabrous outside, densely pilose within; petioles slender, 6 to 15 mm. long, tomentose; leaf blades broadly obovate, thin, 7 to 12 cm. long, 3.5 to 6.5 cm. wide, acute, sometimes abruptly so, acute or rounded at the base, abundantly scabro-hirtellous on the upper surface, densely pubescent beneath with rather short loose soft whitish hairs, not conspicuously veined; only pistillate corollas seen; corella tube 6 to 7 cm. long, densely pubescent outside with long soft white appressed hairs, villous within, the 5 lobes narrowly lanceolate, 45 to 70 mm. long, 9 to 12 mm. wide, long-attenuate, more or less sericeous outside, glabrous within; anthers inserted in the throat of the corolla tube, linear, sessile, 10 mm. long.

Type in the U. S. National Herbarium, no. 678517, collected in forests on dry limestone around Alhajuela, Chagres Valley, Province of Panama, Panama, altitude 30 to 100 meters, May 12 to 15, 1911, by H. Pittier (no. 3473).

The specimens are incomplete, the flowers being represented only by staminate corollas, no calyx being present. This is perhaps nearest *Basanacantha monantha*, but

the form of the corolla is altogether different, the flowers being much larger than those of other members of the genus.

Cassupa panamensis Standley, sp. nov.

A small tree; young branches stout, obtusely quadrangular, densely tomentose with short tawny hairs; stipules 10 to 12 mm. long, triangular-oblong, acuminate, ciliate; petioles stout, 3 to 6.5 cm. long, cinereous-puberulent; leaf blades oval or oval-obovate, 26 to 34 cm. long, 12 to 17 cm. wide, abruptly acuminate, the tips 25 to 30 mm. long, obtuse, shortly acuminate at the base, coriaceous, rugose, dark green on the upper surface and glabrous except for the puberulent veins, the lower surface densely white-puberulent, appearing tomentose, the lateral veins conspicuous, parallel, 18 to 20 on each side, the secondary veins finely reticulate; inflorescence a many-flowered thyrsiform panicle 15 to 19 cm. long and about 11 cm. wide, on a stout peduncle 5 cm. long, or a few flowering branches present at the base of the peduncle, the branches of the inflorescence ascending, stout, compressed, 25 to 35 mm. long, densely hirtellous or tomentose with tawny hairs, the terminal flower sessile, the others on stout compressed pedicels 5 to 10 mm. long; bracts ovate, acute, 2 to 3 mm. long, ciliate, puberulent outside; calyx 1.5 to 2 mm. high, obscurely repand-dentate, ciliolate, glabrous; corolla white, the tube 52 mm. long, slightly dilated in the throat, finely and sparsely puberulent outside and verrucose, villous within the throat; corolla lobes 6, oblong, 11 mm. long, 4.5 mm. wide or less, obtuse or acute, imbricated before anthesis, puberulent outside and within, bearded at the base; filaments 3 mm. long, inserted 28 mm. above the base of the tube; anthers 9 mm. long, abruptly acuminate at the apex; style slender, 32 mm. long, scaberulo-puberulent; stigma oblong, 5 mm. long; fruit elongate-globose, 8 or 9 mm. in diameter, 10 mm. high, 2-celled, smooth, glabrous; seeds numerous, 1 mm. in diameter, foveolate.

Type in the U. S. National Herbarium, no. 678965, collected along the Río Fató, Province of Colón, Panama, altitude 10 to 100 meters, July and August, 1911, by H. Pittier (no. 3889). Additional material is mounted on sheet 678964.

This is the first species of the genus to be reported north of Colombia. It is related to *Cassupa alba* Schum. & Krause, described from the mountains of the interior of Colombia, but is distinguished by the longer corollas, which are tuberculate and puberulent outside rather than smooth and glabrous. The inflorescence is considerably narrower than that described for *C. alba*, but this may be an individual variation.

Chomelia boliviana Standley, sp. nov.

Chomelia tenuiflora Benth.; Rusby, Mem. Torrey Club 3[3]: 45. 1893, not Benth. Journ. Bot. Hook. 3: 235. 1841.

Branches slender, terete, grayish brown, the younger ones pubescent with short loose yellowish hairs, the older ones glabrate, furnished with numerous slender or stout spines 7 to 22 mm. long; stipules not seen, early deciduous; petioles slender, 5 to 12 mm. long; leaf blades elliptic-oval to elliptic-oblong, 4 to 9 cm. long, 15 to 30 mm. wide, acute or abruptly acuminate at the apex, acuminate or attenuate at the base, thin, bright green on both surfaces, sparsely pubescent on the upper surface with short fine appressed hairs, abundantly pubescent beneath, especially along the veins, with slender appressed hairs, the lateral veins prominent; peduncles axillary, 3 to 5 cm. long, densely pubescent, bearing numerous sessile or subsessile flowers in a loosely branched cyme; bracts subulate, 2 to 3 mm. long; calyx 2 mm. long, densely appressed-pubescent, the 4 teeth unequal, about equaling the tube, narrowly triangular, acute; corolla tube slender, 12 to 20 mm. long, densely sericeous, the lobes 4 to 5 mm. long, oblong to oblong-ovate, acute or obtuse.

Type in the U. S. National Herbarium, no. 46974, collected near Yungas, Bolivia, in 1890, by Miguel Bang (no. 342). Also collected between Tipuani and Guanai, Bolivia, by Bang in December, 1892 (no. 1738).

This was described as a new species by Rusby in 1893 under the name of *Chomelia tenuiflora* Benth. "in Herb. Kew." Bentham, however, had published a species of this name many years before, based upon Schomburgk's no. 314 from British Guiana. Schomburgk's plant, a specimen of which is found in the U. S. National Herbarium, is similar in general appearance to the present species, but is easily distinguished by the few flowers, short peduncles, attenuate corolla lobes, and the long, filiform calyx lobes, twice as long as the tube or much longer. Rusby, at the time of publishing a second species under the same name, lists two other specimens besides Bang's no. 342, namely, Matthews's no. 1944 from Peru and a specimen collected by Pearce at Santa Cruz. It is from one of these, presumably, that Bentham's name was taken. It is not probable that so discriminating a botanist as Bentham would have confused so different a plant with that of British Guiana, and it would seem that there must be some confusion of data in the present instance.

The fruit is not present upon either specimen seen by the writer and was not described by Doctor Rusby in his publication of *Chomelia tenuiflora*, but he described it later [1] from Bang's no. 1738 in the following words:

"Nearly 1 cm. long, 2–2.5 mm. broad, oblong, the base slightly narrower, the apex subtruncate, tipped by the conspicuous cup of the calyx-limb, which about equals the strongly recurved teeth, blackish, minutely hispidulous, irregularly and rather lightly costate, slightly curved."

Chomelia boliviana is related to *C. pohliana* Muell. Arg.,[2] described from Brazil, but differs in its looser, more ample cymes, abundant pubescence, less acute corolla lobes, and deciduous stipules.

Chomelia brachyloba Standley, sp. nov.

Branches slender, reddish brown, the older ones glabrate, the younger ones finely pubescent with short, appressed, whitish or brownish hairs, armed with few stout sharp spines 6 to 10 mm. long; stipules subulate, 3 to 4 mm. long, brown; leaves numerous, the slender petioles 10 to 12 mm. long; leaf blades elliptic-oval to oval or broadly ovate, 32 to 80 mm. long, 20 to 35 mm. wide, abruptly acute, the tip about 3 mm. long, attenuate or abruptly acute at the base, thin, bright green on both surfaces, sparsely pubescent on the upper surface with rather long, slender, appressed hairs, more abundantly pubescent beneath, especially along the veins, with similar hairs, the lateral veins prominent, parallel; peduncles slender, 17 to 35 mm. long, densely pubescent with fine appressed hairs, bearing a congested cyme of 6 to 10 sessile or subsessile flowers; bracts half as long as the calyx or less; calyx 1.5 to 2 mm. long, densely appressed-pubescent below, sparsely pubescent above, the lobes triangular-ovate to lanceolate, rather obtuse, much shorter than the tube, unequal; corolla tube slender, 14 to 22 mm. long, densely sericeous, the lobes 5 to 6 mm. long, linear or narrowly lanceolate, abruptly attenuate to the slender tips; fruit oblong, 10 to 12 mm. long.

Type in the U. S. National Herbarium, no. 679833, collected in the Sabana de Juan Corso, near Chepo, Province of Panama, Panama, at an altitude of 60 to 80 meters, October, 1911, by H. Pittier (no. 4673).

Here belongs also a specimen collected in the region of Santa Marta, Colombia, at an altitude of 45 meters, by H. H. Smith (no. 392). This collection was distributed as *C. tenuiflora* Benth. Comparison of these two specimens with one of the type collection of *C. tenuiflora*, Schomburgk's no. 314 from British Guiana, in the U. S. National Herbarium, shows that the proposed species is well distinguished by its long peduncles, numerous flowers, short spines, and more abundant pubescence, and especially by the short calyx lobes. In *C. tenuiflora* the calyx lobes are filiform-subulate and twice as

[1] Mem. Torrey Club **6**: 48. 1896.

[2] See Mart. Fl. Bras. **6**[5]: 34. *pl. 4*. 1881.

long as the tube or even longer. *Chomelia brachyloba* is also related to *C. filipes* Benth., described from Nicaragua, but that species is described as having smaller, fewer flowers, shorter peduncles, and different pubescence. To the present species is probably to be referred Seemann's no. 341, collected near Panama City and reported by Hemsley as *C. tenuiflora*.[1]

Cosmibuena ovalis Standley, sp. nov.

Young branches stout, somewhat fleshy, pale brown; petioles 15 to 25 mm. long; leaf blades oval to broadly oval-obovate, 10 to 14 cm. long, 6 to 8 cm. broad, rounded at the apex, the extreme tip abruptly acute, coriaceous, lustrous above, paler beneath, with 5 to 8 veins on each side, these distant, not conspicuous; inflorescence terminal, 5-flowered; ovary oblong, 12 mm. long, contracted into a stipe of the same or slightly greater length; calyx cylindric, 11 mm. long, with 5 very short, broadly triangular, acute teeth; corolla tube 6 to 7 cm. long, 3.5 to 5 mm. in diameter; corolla lobes narrowly oblong, 25 to 32 mm. long, 9 to 11 mm. wide, rounded at the apex, with short rounded auricles at the base, papillose at the base and short-ciliate; anthers 15 mm. long, subsessile, attached near the base, obtuse, with 2 short appendages at the base; style 65 mm. long, villous above for half its length, the stigma bilamellate, the lamellae thick, 5 to 6 mm. long; ovules with rather short, entire or nearly entire, hyaline appendages.

Type in the U. S. National Herbarium, no. 715202, collected in the vicinity of Olá, Province of Coclé, Panama, altitude 100 to 350 meters, December 7 to 9, 1911, by H. Pittier (no. 5074).

In general appearance this is similar to *Cosmibuena macrocarpa*. The venation of the leaves, however, is very different; the calyx is much larger; and the corolla is larger, with narrow lobes. It does not appear probable that the ovaries would ever develop into a fruit like that figured by Bentham.

Here may belong a specimen in fruit, *Pittier* 3309, collected on cliffs along the Caldera River, between El Boquete and Caldera, Chiriquí. The mature fruit is cylindric and about 45 mm. long.

Cosmibuena paludicola Standley, sp. nov.

Small tree, 4 to 5 meters high, glabrous throughout; young branches thick and somewhat fleshy; stipules oblong-obovate, about 12 mm. long, rounded at the apex, deciduous, thick and leathery; petioles short, stout, 8 to 12 mm. long; leaf blades narrowly obovate to oblong-oblanceolate, 8 to 10 cm. long, 3.5 to 5 cm. wide, rounded at the apex, cuneate at the base, thick and leathery, with about 5 veins on each side, these distant, not conspicuous, anastomosing near the margin; inflorescence terminal, of about 5 flowers; ovary 12 to 14 mm. long, cylindric, contracted into a stout stipe of about the same length; calyx cylindric, circumscissile, 9 mm. long, cleft one-third to one-half the distance to the base, the teeth oblong-ovate, obtuse; corolla white, the tube 6 to 6.5 cm. long, 5 to 6 mm. in diameter, gradually dilated upward; corolla lobes narrowly oblong, 25 mm. long, 9 to 11 mm. wide, rounded at the apex; anthers subsessile, attached near the base, 17 mm. long, obtuse at the apex, with 2 slender appendages at the base; style 65 mm. long, hirsute above; stigma bilamellate, the lamellæ oblong, 10 mm long; ovules with long hyaline appendages.

Type in the U. S. National Herbarium, no. 679204, collected in mangrove swamps, vicinity of Viento Frio, Province of Colón, Panama, August 7 and 8, 1911, by H. Pittier (no. 4107).

Distinguished from all related species, including those of South America, by the combination of obtuse leaves and obtuse corolla lobes. The leaves are unlike those of any other species. The pubescence of the style, too, seems to be characteristic. The plant grows at a lower altitude than most of the species.

[1] Biol. Centr. Amer. Bot. 2: 43. 1881.

Deppea longipes Standley, sp. nov.

Young stems reddish brown, succulent, cinereous-puberulent; stipules very small and inconspicuous, about 1 mm. long; petioles 10 to 20 mm. long; leaf blades oval, broadly oval, or elliptic-oval, 8 to 11 cm. long, 3.5 to 5.5 cm. wide, abruptly acuminate, the tips about 10 mm. long, obtuse, acute, or abruptly acute at the base, bright green, prominently veined, glabrous on the upper surface, sparingly tomentulose beneath along the veins; peduncles 22 to 35 mm. long; cymes many-flowered, 5 to 9 cm. broad, the branches tomentulose; bracts minute; pedicels 2.5 to 6 mm. long, often longer than the fruit; calyx lobes triangular, about 0.6 mm. long; corolla bright yellow, glabrous, the tube about twice as long as the calyx lobes, the lobes of the limb 5 mm. long, oblong, obtuse; anthers exserted, the filaments glabrous, slightly longer than the anthers; capsules 5 mm. long, turbinate, conspicuously costate, glabrate.

Type in the U. S. National Herbarium, no. 677458, collected around Camp Aguacatal, eastern slope of Chiriquí Volcano, Panama, altitude 2,100 to 2,200 meters, March 10 to 13, 1911, by H. Pittier (no. 3070).

In general appearance this resembles *D. floribunda* Hemsl., but it is distinguished from that and the other Mexican and Central American species by the large capsules and long pedicels.

Faramea luteovirens Standley, sp. nov.

A small tree or large shrub, often branched from the base, with straight trunk, smooth bark, and radiate branches, glabrous throughout; young stems stout, yellowish green; stipules much wider than long, with a subulate tip, soon deciduous; petioles stout, 6 to 10 mm. long; leaf blades oblong-oval, 9 to 14 cm. long, 4 to 6 cm. wide, obtuse at the base, abruptly caudate at the apex, with an obtuse or acute, narrowly triangular tip 10 to 14 mm. long, yellowish green, coriaceous, the midvein very prominent, the lateral veins conspicuous, 8 to 13 on each side, diverging at nearly right angles, anastomosing near the margin, but not forming a regular or conspicuous marginal vein; inflorescence a sessile panicle, sparsely branched, the central axis 6 cm. long, the lateral ones 1 cm. long or less, the pedicels rather stout, thicker above, 3 cm. long; fruit subglobose, 8 to 9 mm. in diameter, smooth, thick-walled, bearing at the summit the truncate calyx limb (or base of the limb?); no mature seeds seen, the immature ones solitary, with a very deep basal depression.

Type in the U. S. National Herbarium, no. 679194, collected on Loma de la Gloria, near Fató, Province of Colón, Panama, in forests, altitude 10 to 100 meters, August, 1911, by H. Pittier (no. 4098).

Readily distinguished from the other Panamanian species by the yellowish green, coriaceous leaves and long pedicels.

Faramea ovalis Standley, sp. nov.

A small slender tree, 6 to 8 meters high, with a straight trunk and pyramidal crown, glabrous throughout; young branches very slender, green; stipules broadly rounded, 1.5 mm. long or less, each bearing a subulate tip 3 to 9 mm. long; petioles slender, 4 to 10 mm. long; leaf blades oval or rarely obovate-oval or oval-oblong, 4 to 8 cm. long, 2 to 5 cm. wide, rounded to acute at the base, abruptly caudate at the apex, the tip 6 to 10 mm. long and 2 to 3 mm. wide, obtuse or rounded, the blades bright green, thin, with 7 to 11 lateral veins on each side, these not conspicuous, diverging at nearly right angles; peduncles 12 to 17 mm. long; flowers in simple umbels, usually 4 on each peduncle, on pedicels 12 to 14 mm. long; calyx and ovary together 3 mm. long, narrowly campanulate, green, glabrous, the limb very shallowly and obscurely dentate; corolla purplish white, 14 to 17 mm. long, glabrous outside, the tube 10 to 11 mm. long, 2.5 mm. in diameter, the throat but slightly inflated, the lobes ovate-oblong, acute or acutish, puberulent within; style slightly exserted; fruit not known.

Type in the U. S. National Herbarium, no. 675764, collected in forests along the Río Ladrillo, above El Boquete, Chiriquí, Panama, altitude 1,200 to 1,300 meters, March

17 to 19, 1911, by William R. Maxon (no. 5397). Also collected between the Río Ladrillo and Los Siguas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, altitude 1,200 to 1,700 meters, March 17 to 19, 1911, by H. Pittier (no. 3159).

Related to *Faramea occidentalis* (L.) A. Rich., which is represented by several Panama collections, but differing in its smaller leaves, umbellate rather than corymbose inflorescence, and shorter corolla.

Faramea scalaris Standley, sp. nov.

A glabrous shrub; young branches slender, green; stipules 5 to 7 mm. long, united and sheathing, the free border rounded, obtuse, or acutish, with a mucronate tip 1.5 mm. long or less; petioles very stout, 2 to 5 mm. long; leaf blades narrowly elliptic-oblong to narrowly oblanceolate, 10 to 16 cm. long, 1.5 to 3 cm. wide, acuminate, often rather abruptly so, to a rounded tip, acute at the base, bright green, rather thin, the midvein very prominent, the lateral nerves 8 to 14 on each side, divergent nearly at right angles, anastomosing near the margin in a very conspicuous marginal vein; flowers in a compound umbellate inflorescence about 4 cm. long, the peduncle about 15 mm. long; bracts minute, pedicels 3 to 4 mm. long, strongly tinged with blue; calyx and ovary together 2 mm. long, campanulate, glabrous, blue, the limb dentate, the teeth triangular, acutish, corolla purplish white, glabrous, 11 to 12 mm. long, the tube slender, slightly broadened in the throat, the lobes ovate-oblong, 4 mm. long, obtuse; fruit not known.

Type in the U. S. National Herbarium, no. 677656, collected in the humid forest between Alto de las Palmas and top of Cerro de la Horqueta, Chiriquí, Panama, altitude 2,100 to 2,268 meters, March 18, 1911, by H. Pittier (no. 3265).

The affinities of the present species are apparently with the Brazilian *Faramea salicifolia* Presl, but in that plant the stipules are long-aristate and the venation of the leaves is very different.

Guettarda foliacea Standley, sp. nov.

A small tree or large shrub, branching from the base, with spiny arcuate branches; older branches slender, terete, dark brown, the youngest ones obtusely quadrangular, densely strigose-hispidulous; stipules 5 mm. long, oblong-triangular, early deciduous; petioles slender, 10 to 22 mm. long, strigose-hispidulous; leaf blades elliptic or elliptic-oval, 10 to 16 cm. long, 3.5 to 5.5 cm. wide, rather abruptly acute, acute to obtuse at the base, thinly membranous, bright green, very sparsely hispid on the upper surface with rather short hairs, strigillose beneath, prominently veined, the veins slender, about 8 on each side; peduncles slender, 10 to 15 mm. long, strigose-hispidulous, bearing few densely cymose sessile or short-pedicellate flowers; bracts 4 to 5 mm. long, narrowly oblong or linear-oblong, obtuse, green and foliaceous, persistent, glabrous on the inner surface, sparsely pubescent on the outer, long-ciliate; calyx broadly cylindric, 2 mm. long, densely pubescent with short appressed hairs, the margin truncate and entire or nearly so; corolla tube 15 to 17 mm. long, slender, densely sericeous, the lobes oblong or oblong-oval, obtuse, 4 mm. long; style about 2 cm. long, slender, bearing a few long slender appressed hairs, the stigma very small; fruit not seen.

Type in the U. S. National Herbarium, no. 679116, collected along the Trinidad River, Canal Zone, Panama, near sea level, July 19 to 21, 1911, by H. Pittier (no. 4031).

Readily distinguished by the large, foliaceous, long-ciliate bracts. The leaves, too, are very large and thin, being similar in texture to those of *G. ramuliflora*.

Hamelia pauciflora Standley, sp. nov.

Shrub with slender branches, the older ones grayish, terete, the younger ones obtusely angled, sparsely short-villous; stipules very small; petioles rather stout, 2.5 mm. long or less; leaves mostly in 3's, the blades broadly ovate to ovate or oval-ovate, 15 to 28 mm. long, 7 to 15 mm. wide, acute or acutish, acute or obtuse at the base,

very thin, bright green, glabrous on the upper surface, sparsely short-villous beneath, ciliolate, very faintly veined, the lateral veins 3 or 4 pairs; peduncles terminating short lateral branches, 2 to 4-flowered, sometimes dichotomous or often reduced to a single secund branch, the flowers in the axils of the branches sessile or subsessile, the others on slender pedicels 10 mm. long or less, the peduncles slender, 7 to 15 mm. long, sparsely villous; calyx 3 to 3.5 mm. long, glabrous or nearly so, the lobes broadly triangular, less than half as long as the tube; corolla about 22 mm. long, slightly broadened upward, very sparsely villous outside, especially about the lobes, these oval-ovate, obtuse, 1.5 mm. long; anthers equaling or usually slightly exceeding the corolla lobes; fruit not seen.

Type in the U. S. National Herbarium, no. 678513, collected in forests on dry limestone, around Alhajuela, Chagres Valley, Province of Panama, Panama, at an altitude of 30 to 100 meters, May 12 to 15, 1911, by H. Pittier (no. 3469).

Distinct from all other species by the much reduced inflorescence and small leaves. It is related, possibly, to *H. chrysantha* Swartz, but has fewer, differently arranged flowers, shorter petioles, and more pubescent, thinner, verticillate leaves.

Hoffmannia pittieri Standley, sp. nov.

Stems herbaceous, terete, glabrous; stipules triangular, acutish, 3 mm. long; petioles slender, glabrous, 2 to 3 cm. long; leaf blades oblong-obovate to oval-oblong, 12 to 24 cm. long, 6 to 9 cm. wide, abruptly acuminate, the tips obtuse, attenuate to the base, glabrous, dull green above, paler beneath, prominently veined; cymes on peduncles 2 to 3 mm. long, the secondary branches 10 to 18 mm. long, angled, puberulent, the whole inflorescence loose and open; bracts oblong-linear, acute, deciduous; pedicels (in fruit) about 4 mm. long; open flowers not seen, the corolla said to be yellow; calyx and ovary together (in bud) about 3 mm. long, sparingly puberulent, the calyx lobes ovate, obtuse or acutish; fruit cylindric-campanulate, 5 mm. long, glabrous, costate; seeds numerous, brown, favose.

Type in the U. S. National Herbarium, no. 677642, collected in the humid forest between Alto de las Palmas and top of Cerro de la Horqueta, Chiriquí, Panama, altitude 2,100 to 2,250 meters, March 18, 1911, by H. Pittier (no. 3247).

Distinguished from the other Costa Rican and Panamanian species by its open inflorescence and large, broad leaves.

Palicourea chiriquina Standley, sp. nov.

A shrub 2 to 3 meters high, glabrous throughout; branches rather stout, yellowish green, obtusely quadrangular; stipules united to form a sheath 2 to 3 mm. long, each stipule bilobate, the lobes linear, acute, slightly shorter than the sheath; petioles stout, 6 to 15 mm. long; leaf blades elliptic-oval or elliptic-oblong, 5 to 10.5 cm. long, 2 to 5 cm. wide, acute or acuminate, often abruptly so, obtuse to broadly cuneate at the base, subcoriaceous, yellowish green, somewhat lustrous on the upper surface, the veins conspicuous on both surfaces, diverging nearly at right angles, the lateral ones about 15 on each side, parallel; inflorescence thyrsoid-paniculate, on peduncles 2 to 4 cm. long, the panicles 4 to 5 cm. long and 2.5 to 4.5 cm. wide, loosely branched, the branches spreading, green; bracts oblong or narrowly ovate, 1.5 to 3 mm. long; pedicels slender, 2 to 4 mm. long; calyx scarcely 1 mm. long, about equaling the ovary, the lobes of the limb rounded-ovate, obtuse; corolla 6 mm. long, stout, sulphur-yellow, glabrous outside, long-bearded within at about the middle, the lobes of the limb very short, rounded-ovate; fruit not seen.

Type in the U. S. National Herbarium, no. 677607, collected in the humid forest of Cuesta de las Palmas, southern slope of Cerro de la Horqueta, Chiriquí, Panama, at an altitude of 1,700 to 2,100 meters, March 17 to 19, 1911, by H. Pittier (no. 3211). Additional material is mounted on sheet 677606.

Related to *Palicourea mexicana*, but sufficiently distinguished by the short yellow corolla, spreading green branches of the inflorescence, and smaller leaves.

Along with the type specimens Mr. Pittier collected a short branch of another and probably undescribed species. This has a densely pubescent inflorescence, oval leaves, and very small corollas. The material is too fragmentary for diagnosis.

Palicourea heterantha Standley, sp. nov.

Young branches stout, obtusely quadrangular, the lower internodes glabrous, the uppermost densely villous with multicellular hairs, or sometimes villous only along the angles; stipules united into a loose sheath 5 to 7 mm. long, each stipule bilobate, the lobes oblong-linear, acute, as long as the sheath or sometimes longer, glabrous, sometimes ciliate; petioles stout, 1 to 2 cm. long, villous; leaf blades obovate to broadly oval-obovate, 8 to 13 cm. long, 4.5 to 7 cm. wide, rounded at the apex and coarsely apiculate, the tip triangular, 3 mm. long, acutish or broadly cuneate at the base, subcoriaceous, dull green, slightly lustrous above and glabrous beneath, short-villous, especially along the veins; peduncles stout, 3 to 3.5 cm. long; inflorescence thyrsoid-paniculate, 5 to 6 cm. long and of about the same breadth, copiously branched, the branches stout, ascending or spreading, densely short-villous; bracts lanceolate or lance-ovate, 3 to 8 mm. long; pedicels stout, 1 to 4 mm. long; calyx 2 mm. long, slightly longer than the ovary, deeply lobed, the lobes broadly ovate-oblong, obtuse, glabrous, bluish when dried; corolla 10 to 12 mm. long and 5 to 6 mm. in diameter, very gibbous at the base, the lobes very broad, rounded, thick and leathery, glabrous outside, sparsely villous within below the middle; stamens inserted at the middle of the corolla tube, the filaments short, the anthers included; fruit not seen.

Type in the U. S. National Herbarium, no. 531296, collected on the headwaters of the Río López, Río Palo Basin, Tierra Adentro, State of Cauca, Colombia, at an altitude of 2,500 to 3,000 meters, January, 1906, by H. Pittier (no. 1098).

Althcugh the fruit has not been seen, there is little doubt that this plant is a member of the genus Palicourea. From the Colombian species previously described it is well distinguished by the very broad corolla, the loose sheaths of the stipules, and the villous pubescence. It is impossible to state the color of the fresh flowers, but when dried they are bluish.

Rondeletia secunda Standley, sp. nov.

Shrub; young branches slender, glabrous, brown; stipules 4 to 5 mm. long, persistent, triangular, with a subulate apex; petioles stout, 3 to 7 mm. long, glabrous; leaf blades elliptic to elliptic-oval, 10.5 to 16 cm. long, 3.5 to 6.5 cm. wide, abruptly acuminate or subattenuate, obtuse or acutish at the base, firm, green, glabrous on both surfaces or sometimes with a very few short hairs along the veins beneath, the veins prominent, the lateral ones about 8 pairs; flowers numerous, secund and subsessile along the slender, spreading or scorpioid branches of the loose panicle, this 6 to 7 cm. long and of about the same breadth, on a peduncle about 6 cm. long, the flowers rather distant upon the branches; branches of the inflorescence sparsely villous, the bracts small, green, linear; calyx tube 1.5 mm. long, villous but not densely so, the 4 lobes linear or oblong-linear, green, sparsely pubescent, longer than the tube, sometimes twice as long, unequal, one of the lobes usually broader and longer than the others; corolla white, the tube slender, 10 to 12 mm. long, rather sparsely villosulous outside, the 4 lobes rounded, 3 to 4 mm. long, the throat naked; stamens inserted below the middle of the tube; stigma shortly 2-lobed; capsules 4 mm. high, bearing the persistent calyx lobes; seeds very small, light brown, favose.

Type in the U. S. National Herbarium, no. 679392, collected in forests around Puerto Obaldía, San Blas Coast, Panama, at an altitude of 50 meters or less, August, 1911, by H. Pittier (no. 4279).

Distinguished from the other species of Central America and northern South America by the secund arrangement of the flowers in the open panicles and by the glabrous leaves and long calyx lobes.

Rustia ferruginea Standley, sp. nov.

A small tree; young branches stout, obtusely quadrangular, villous-puberulent with soft reddish hairs; stipules not seen, deciduous; petioles stout, very short, 1 to 3 cm. long; leaf blades obovate or oval-obovate, 15 to 30 cm. long, 7 to 12 cm. wide, rather abruptly acute or acuminate, acuminate or attenuate at the base, firm, rather inconspicuously veined, the lateral veins numerous, parallel, meeting at their apices in a marginal vein, glabrous on the upper surface, densely puberulent beneath with ferruginous hairs; inflorescence a densely flowered, short-pedunculate, terminal panicle 8 to 10 cm. long and of about the same width, the branches abundantly puberulent; bracts deciduous; calyx broadly campanulate, 1.5 mm. high, puberulent outside, the margin shallowly 5-lobed; corolla white, the tube 2 to 4 mm. long, slightly dilated above, glabrous outside, the lobes valvate, thick, about as long as the tube, lance-triangular, acute or acutish, puberulent, reflexed in anthesis, the throat of the corolla densely bearded within with coarse white hairs; stamens mostly concealed by the hairs of the corolla, the filaments subulate, the anthers erect, attached by the base; style exserted, shortly 2-lobed at the apex; ovary 2-celled; mature fruit not seen.

Type in the U. S. National Herbarium, no. 679302, collected along the Río Fató, Province of Colón, Panama, in forests or thickets, altitude 10 to 100 meters, August, 1911, by H. Pittier (no. 4201).

From all other species of the genus this differs in its ferruginous pubescence.

Stachyarrhena heterochroa Standley, sp. nov.

A small tree, 8 to 10 meters high, with a straight trunk, radiate branches, and a pyramidal crown; bark grayish, smooth; young branches stout, terete, lustrous, glabrous; stipules 2 to 3 mm. high, united and forming a truncate sheath; petioles stout, 2 to 3 cm. long; leaf blades oval to oblong-elliptic or rarely oblong-obovate, 15 to 28 cm. long, 5 to 9 cm. wide, abruptly acuminate or sometimes caudate, the tip about 15 mm. long, acute at the base, coriaceous, glabrous, shining on the upper surface, the veins prominent, especially the midrib, the lateral veins 9 to 12 on each side; spikes pendulous, mostly terminal, 18 to 28 cm. long, glabrous, naked at the base for 4 to 7 cm., the flowers sessile, solitary and remote, or sometimes verticillate; calyx broadly campanulate, 2 mm. high, the margin very obscurely repand-denticulate; corolla 8 mm. long, turbinate, purplish pink inside, pale pink or lavender outside, the 5 lobes broadly oblong or rounded-oblong, slightly spreading, densely villous within; stamens inserted on the middle of the tube, the filaments very short; stigmas broad, acute.

Type in the U. S. National Herbarium, no. 679174, collected in forests on Loma de la Gloria, near Fató, Province of Colón, Panama, altitude 10 to 100 meters, August, 1911, by H. Pittier (no. 4078).

The fruit, which was not collected, is said to be the color of a cherry.

Only three other species of this genus have been described, all from Brazil. The Panama plant resembles *Stachyarrhena penduliflora* Schum.[1] in its pendulous inflorescence. That species, however, has yellow flowers, obtuse leaves, and a tubular corolla.

[1] In Mart. Fl. Bras. 6[6]: 370. 1889.

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II

PREFACE.

The present paper, which is the third of a series upon tropical American phanerogams by Mr. Paul C. Standley, Assistant Curator of the United States National Herbarium, consists chiefly of descriptions of new species of shrubs and trees, largely Leguminosae from Mexico and Rubiaceae from several regions of tropical North America. The former are preliminary to the proposed publication of a systematic work upon the woody plants of Mexico, upon which Mr. Standley is engaged. There is included a synopsis of the Mexican and Central American species of Erythrina, a group whose species have long been in confusion.

FREDERICK V. COVILLE,
Curator of the United States National Herbarium.

CONTENTS.

STUDIES OF TROPICAL AMERICAN PHANEROGAMS—NO. 3.

By PAUL C. STANDLEY.

INTRODUCTION.

The third paper of this series[1] is devoted almost wholly to trees and shrubs of tropical and subtropical North America, chiefly those of Mexico. The principal exception is an account of the Panamanian species of *Leiphaimos*, a genus of the Gentianaceae, whose representatives are interesting because of their saprophytic habit and the diverse forms of their flowers.

The writer has been engaged recently upon a proposed systematic account of the woody plants of Mexico, and it is as a result of this work that many of the new species here described are published. Most of the latter belong to the group Leguminosae, although representatives of several other families of Mexican plants are described. There is included, in addition, a brief account of the Mexican and Central American species of *Erythrina*.

In the course of work upon the family Rubiaceae for the North American Flora, numerous plants have been discovered which are not referable to any of the published species. Some of the most interesting of these have been discussed elsewhere,[2] but others are treated in the present paper. Most of the Rubiaceae described here belong to the genera *Randia* and *Hoffmannia*.

THE MEXICAN SPECIES OF ATELEIA.

Several species of *Ateleia* have been described from South America and the West Indies, but only one, *A. pterocarpa* DC., the generic type, has been reported from Mexico. *Ateleia pterocarpa* was based upon one of Sessé and Mociño's plates, and the writer has been unable to find any published reference to the collection of specimens. There are, however, in the National Herbarium several Mexican col-

[1] See also Contr. U. S. Nat. Herb. 17: 427–458. *pls.* 24–31. 1914; 18: 87–142. 1916.

[2] Standley, Paul C., *Blepharidium*, a new genus of Rubiaceae from Guatemala, Journ. Washington Acad. Sci. 8: 58–60. 1918; *Omiltemia*, a new genus of Rubiaceae from Mexico, op. cit. 8: 426, 427. 1918.

lections of the genus, at least two of which represent undescribed species.

KEY TO THE SPECIES.

Seeds 12 to 15 mm. long, strongly compressed; leaflets mostly oblong or lance-oblong, 1 to 1.5 cm. wide. Upper suture of the fruit convex--1. A. arsenii.

Seeds 5 to 7 mm. long, turgid; leaflets mostly ovate to rounded-oval, usually 2.5 to 5.5 cm. wide.

Upper suture of the fruit straight or concave; seeds about 5 mm. long; leaflets oval or rounded-oval----2. A. pterocarpa.

Upper suture of the fruit convex; seeds about 7 mm. long; leaflets mostly oblique-ovate----3. A. insularis.

1. Ateleia arsenii Standl., sp. nov.

Branchlets copiously tomentose, especially when young, with fulvous hairs; rachis of the leaf 7 to 19 cm. long; leaflets about 15, oblong, lance-oblong, or ovate-oblong, 2.5 to 4.8 cm. long, 1 to 1.5 cm. wide, broadly and obliquely rounded at the base, rounded or very obtuse at the apex, coriaceous, with prominulous, finely reticulate venation, at first short-pilose on the upper surface, but glabrate in age, tomentose beneath when young, the pubescence scant in age; racemes very numerous, 8 to 14 cm. long, loosely many-flowered, the bracts minute, linear-subulate; calyx 4.5 mm. long, turbinate-campanulate, fulvous-tomentulose, very obscurely dentate or entire; blade of the standard petal rounded-oval, 8 to 9 mm. long, 7 to 8 mm. wide, pilose outside, abruptly decurrent to a short slender claw, the margin of the blade irregularly crenulate; stamens only slightly longer than the calyx; fruit about 2.8 cm. long and 1.6 cm. wide, glabrate, prominently reticulate-veined, abruptly decurrent at the base to a stipe 1.5 cm. long, the upper suture convex, sharply carinate but almost exalate; seeds 12 to 15 mm. long, 7.5 to 9 mm. wide, strongly compressed, castaneous.

Type in the U. S. National Herbarium, no. 1000106, collected on Pico de Quinceo, near Morelia, Michoacán, in 1910, by Brother G. Arsène (no. 6655). This specimen consists of fruiting material. Another collection, in flower, was obtained upon the same mountain, at an altitude of 2,800 meters, March 11, 1909, by Brother Arsène (no. 2790).

Readily distinguished from the other Mexican species by the large, flat seeds and small, narrow leaflets. This is the only species of which the writer has seen flowers.

It is a pleasure to be able to name this well-marked species in honor of one of the most assiduous collectors of Mexican plants. During about eight years' residence in Mexico Brother Arsène obtained one of the largest series of the plants of that country ever secured by one collector. This consists of nearly eleven thousand numbers of flowering plants, chiefly from the states of Puebla and Michoacán, besides a large quantity of cryptogams. Through the generosity of Brother Arsène, the most complete series of these collections has now been deposited in the National Herbarium.

2. Ateleia pterocarpa DC. Prodr. 2: 419. 1825.

Pterocarpus ateleia Moc. & Sessé; DC. Prodr. 2: 419. 1825, as synonym.

This, the type species of the genus, was based upon one of Sessé and Mociño's drawings,[1] and De Candolle gives the locality merely as Mexico. In the second edition of their Flora Mexicana[2] Sessé and Mociño give a long description of

[1] Calq. Dess. Fl. Mex. *pl. 288, pl. XXV, A.*

[2] 164. 1894.

the plant under the generic name *Amorpha*, but without a specific designation. In this later work the locality for the plant is given as "In agris Cordovae et in Praedio S. Josephi."

Of the specimens at hand those which agree best with the plate and description were collected at Acaponeta, Tepic, April, 1910, by J. N. Rose, P. G. Russell, and P. C. Standley (no. 14474). The fruit of these specimens agrees almost exactly with that figured. The leaflets, however, are less numerous, broader, and rounded rather than acute at the apex. It is not improbable that the Tepic specimens represent an additional new species, but it is unsafe to describe them as such until some plant agreeing better with the original illustration is collected. The tracings of Sessé and Mociño's plates are so obviously imperfect that no confidence can be placed in the characters they seem to indicate. The writer is unable to determine the location of the localities mentioned by Sessé and Mociño. If the well-known Córdoba in Veracruz is the one referred to, it is probable that the typical plant is still unknown in herbaria.

The specimens obtained by Doctor Rose and the writer were taken from a handsome tree about 6 meters high. The fruit is borne in the greatest profusion. It is about 2 cm. long and 1.3 cm. wide, with the upper suture straight or concave, and bordered by a thin wing about 1 mm. wide.

3. **Ateleia insularis** Standl., sp. nov.

Branchlets strigillose-puberulent, with numerous conspicuous pale lenticels; leaf rachis 15 to 24 cm. long; leaflets about 13, ovate or very obliquely oblong-ovate, 4 to 6.5 cm. long, 2.2 to 3 cm. wide, broadly rounded and very oblique at the base, obtuse at the apex, subcoriaceous, with prominulous, finely reticulate venation, in age nearly glabrous except for a few minute appressed hairs along the veins; racemes 6 to 12 cm. long, rather densely flowered, the flowers short-pedicellate; calyx truncate, strigillose-puberulent, 2.5 mm. long; fruit 2.2 to 3 cm. long, 1.5 to 2 cm. wide, glabrous, the upper suture convex, furnished with a thin wing 2 to 3 mm. wide; seed turgid, about 7 mm. long and 4 mm. wide, dark reddish brown.

Type in the U. S. National Herbarium, no. 345929, collected on María Madre Island, off the Pacific coast of Mexico, May, 1897, by E. W. Nelson (no. 4186). Also obtained at the same locality, May 7, 1897, by F. S. Maltby (no. 73).

Closely related to the Tepic plant discussed above, but sufficiently different in the form of the fruit and leaflets to deserve specific rank. Although only a small amount of Mexican material is available for study, examination of an extensive series of specimens of the Cuban *Ateleia cubensis* Griseb. indicates that the form of the fruit is very constant.

THE MEXICAN AND CENTRAL AMERICAN SPECIES OF ERYTHRINA.

The North American species of *Erythrina* have never been monographed, and no attempt has ever been made to correlate the large number of published names. Many of the species are known only from very imperfect descriptions or from equally unsatisfactory illustrations, and the difficulty of any attempt to formulate a satisfactory account of the genus is increased by the incompleteness of most herbarium specimens. The plants seldom bear flowers and fruit at the same time, and since they often flower when devoid of leaves it is difficult to assemble complete material that is certainly

of the same species. The following account of the continental North American species, though far from satisfactory, will make possible at least an approximate determination of collections.

The plants of this genus are of some economic importance, and there are many references to them in the literature relating to Mexican botany. Unfortunately, their nomenclature is in such confusion that no confidence may be placed in the specific names under which the properties of the plants have been discussed. This, however, is a matter of little importance, since it is probable that most of the species have approximately the same properties. The Mexican plants are generally referred to in literature as *Erythrina corallodendron* or *E. coralloides*. The application of the latter name is uncertain, and *E. corallodendron* probably does not occur in Mexico.

The vernacular names given below under the species have been verified from herbarium specimens. The following names are used in Mexico for the species, probably without discrimination as to specific limits: "Colorín" (Jalisco, Valley of Mexico, Puebla), "zumpantle" (Veracruz, Distrito Federal), "peonía" (Jalisco), "purénchequa" (Michoacán, Tarascan), "pureque" (Michoacán), "tzompantli" (Valley of Mexico), "tzinacanquáhuitl" (Nahuatl), "zompantle" (Valley of Mexico), "chacmol-ché" (Yucatán, Maya), "coralina" (Baja California), "chilacoyote" (seeds, Baja California), "chocolén," "iquimite," "pito" (Veracruz), "patol" (seeds), "pichoco."

The species of *Erythrina* are often planted for hedges, partly because of their usually well-armed branches and partly on account of their showy red flowers. It is stated that the Aztecs used the plants extensively in this way, just as the people of modern Mexico employ them. Branches of the trees or shrubs broken off and placed in the ground root readily. The wood is very soft and light, and is used for the same purposes as cork. The bark furnishes a yellow dye for cloth, etc. The succulent flowers are eaten, either raw or cooked, at Cuernavaca and elsewhere. The handsome seeds have been used by the Mexicans of both pre-Conquest and modern times as articles of ornament.

Various medicinal properties are attributed to the Mexican Erythrinas. The roots are said to be sudorific; a decoction of the flowers is sometimes used for chest affections; and the bark is reputed to have purgative and diuretic action. The juice of the stems is reported to have been used as a remedy for scorpion stings. The bark and seeds are said to contain a powerful alkaloid, to which the name erythrine has been given. This alkaloid has a marked effect upon the nervous system, causing paralysis of the motor nerves. If taken internally in sufficient quantities the seeds produce death. They have been used

by the natives of various parts of tropical America as a hypnotic. Because of the characteristic narcotic properties the crushed stems of the plants are sometimes thrown into water to stupefy fish.

KEY TO THE SPECIES.

Standard petal very broad, oval or flabelliform.
  Standard long-clawed; leaflets rounded or very obtuse at the apex. Tree, armed with stout spines; corolla orange or salmon.....1. E. glauca.
  Standard not clawed; leaflets acutish to acuminate at the apex.
    Calyx truncate. Tree, armed with small spines.....2. E. darienensis.
    Calyx bilobate. Shrub, armed with spines; seeds brown, large.
      3. E. breviflora.
Standard petal narrow, linear to linear-oblong.
  Fruit and ovary aculeate. Plants herbaceous.
    Calyx dentate.....4. E. setosa.
    Calyx cleft on one side at the apex, not dentate. Seeds very large, nearly black.....5. E. leptorhiza.
  Fruit and ovary not aculeate.
    Calyx cleft on one side at the apex, or conspicuously bilobate.
      Calyx cleft on one side at the apex.
        Pods coiled; leaflets ovate or ovate-oblong. Shrub; seeds scarlet.
          6. E. cochleata.
        Pods straight or nearly so; leaflets mostly deltoid. Large or small tree; flowers pink.....7. E. rubrinervia.
      Calyx bilobate.
        Leaflets ovate or lance-ovate; petioles aculeate. Small tree; flowers green and red.....8. E. lanceolata.
        Leaflets suborbicular or deltoid; petioles usually unarmed.
          Venation of the leaflets prominently reticulate; leaflets tomentulose beneath when young; pods only slightly constricted between the seeds.....9. E. montana.
          Venation of the leaflets not prominently reticulate; leaflets sericeous beneath when young; pods deeply and abruptly constricted between the seeds.....10. E. costaricensis.
    Calyx truncate.
      Standard densely lanate or tomentulose. Shrubs or small trees.
        Seeds about 8 mm. long; standard 7 cm. long; pods deeply constricted between the seeds.....11. E. lanata.
        Seeds about 12 mm. long; standard 5 to 5.5 cm. long; pods shallowly constricted between the seeds.....12. E. occidentalis.
      Standard glabrous or nearly so.
        Leaflets, at least the terminal ones, conspicuously lobate. Shrubs or herbs; seeds scarlet; flowers red.....13. E. herbacea.
        Leaflets never lobate.
          Seeds about 15 mm. long; leaflets usually rounded or very obtuse at the apex.....14. E. flabelliformis.
          Seeds about 10 mm. long; leaflets usually acute or acuminate at the apex.
            Standard 8 cm. long; pods deeply constricted between the seeds; leaflets aculeate beneath.....15. E. goldmanii.
            Standard 6.5 cm. long or shorter; pods only slightly constricted between the seeds; leaflets not aculeate.....16. E. americana.

1. **Erythrina glauca** Willd. Ges. Naturf. Freund. Berlin Neue Schrift 3: 428. 1801.

Erythrina patens DC. Prodr. 2: 414. 1825.

Duchassaingia glauca Walp. Ann. Bot. 2: 424. 1851.

TYPE LOCALITY: Caracas, Venezuela.

DISTRIBUTION: Guatemala (*Heyde & Lux* 6329); Nicaragua (*Shannon* 5023, *Baker* 690); Panama (*Pittier* 2571, 6942, 2744; *Fendler* 81; *Maxon* 4790; *Christopherson* 142; *Goldman* 1853). Also in Cuba, Porto Rico, the Lesser Antilles, and Venezuela.

Erythrina patens was based upon one of Sessé and Mociño's plates,[1] which agrees exactly with the present plant. De Candolle gives the habitat as Mexico, but the writer has seen no Mexican specimens. Perhaps the plate was drawn from Guatemalan or Porto Rican specimens.

2. **Erythrina darienensis** Standl. Contr. U. S. Nat. Herb. 18: 108. 1916.

DISTRIBUTION: Known only from the type locality, near Pauarandó, southern Darién, Panama.

3. **Erythrina breviflora** DC. Prodr. 2: 413. 1825.

Erythrina latiflora Sessé & Moc. Pl. Nov. Hisp. 15. 1887.

Erythrina petraea T. S. Brandeg. Zoe 5: 247. 1908.

TYPE LOCALITY: Ayacapixtla, Mexico.

DISTRIBUTION: Jalisco (*Rose & Painter* 7511); Guanajuato (*Duges* 2); Morelos (*Pringle* 6512); Michoacán (*Pringle* 11964; *Arsène* 2868); Puebla (*Purpus* 5554).

De Candolle's description was based upon one of Sessé and Mociño's plates.[2] The description by the latter authors is much more ample, and when combined with the illustration leaves no doubt concerning the identity of the species.

Erythrina petraea was based upon Purpus's no. 2680, from Cerro de la Yerba, Puebla. Although the writer has not seen the type, the description applies to the present plant, and other specimens determined by Brandegee as *E. petraea* evidently belong here. Specimens collected by Purpus in 1908 at the type locality of *E. petraea* are remarkable for their small leaflets.

4. **Erythrina setosa** Mart. & Gal. Bull. Acad. Brux. 10[2]: 194. 1843.

TYPE LOCALITY: Regla, at 1,800 meters, and the eastern Cordillera of Oaxaca, at 2,100 meters.

DISTRIBUTION: Oaxaca (*Pringle* 4687; *Rose & Hough* 4599; *Conzatti & González* 35; *Conzatti* 1422, 1507).

Probably *Erythrina horrida* DC.[3] is the same as *E. setosa*, but the plate of Sessé and Mociño,[4] upon which De Candolle's description is based, is too poor for certain determination. Perhaps *E. horrida* is, rather, the same as *E. leptorhiza*. De Candolle describes the calyx of the former as 5-dentate, and it is so illustrated, but in view of the fact that the only calyces shown are the old ones investing the stipe of the fruit, it is probable that their delineation is fictitious.

5. **Erythrina leptorhiza** DC. Prodr. 2: 413. 1825.

TYPE LOCALITY: Mexico, the description based on one of Sessé and Mociño's plates.[5]

DISTRIBUTION: State of Mexico (*Rose & Hay* 5410, 5639; *Pringle* 6638, 5743; *Rose & Painter* 7831); Morelos (*Pringle* 6869); Hidalgo (*Pringle* 11965; *Rose & Hay* 5299); Puebla (*Arsène* 10039; *Nicolas* 128); Oaxaca (*Conzatti* 1790); Michoacán (*Arsène* 7220, 6818, 7367).

Known in Michoacán as "patol" and "colorín negro."

Pringle's no. 6638 was distributed as a new species.

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[1] Calq. Dess. Fl. Mex. *pl. 255.* [2] Prodr. 2: 413. 1825. [3] Calq. Dess. Fl. Mex. *pl. 250.*
[4] Calq. Dess. Fl. Mex. *pl. 251.* [5] Calq. Dess. Fl. Mex. *pl. 252.*

6. Erythrina cochleata Standl., sp. nov.

Shrub, the branches gray, apparently unarmed; petioles stout, glabrous or nearly so, unarmed; leaflets ovate or ovate-oblong, 10.5 to 15.5 cm. long, 4.5 to 6.5 cm. wide, rounded at the base, narrowed to the acuminate apex, subcoriaceous, concolorous, glabrous at maturity, the venation finely and prominently reticulate; racemes about 6 cm. long, the rachis brown-tomentulose; calyx 2 cm. long, narrow, brown-tomentulose or glabrate, cleft on one side at the top for about 8 mm., the limb acute, with 2 small teeth on each side; standard oblong-linear, 7 cm. long, about 6 mm. wide, glabrous, the keel shorter than the calyx; fruit 2 or 3-seeded, coiled into a complete circle, slightly constricted between the seeds, glabrate, long-stipitate; seeds scarlet, about 9 mm. long.

Type in the U. S. National Herbarium, no. 861527, collected at Hacienda La Colombiana, Costa Rica, by A. Tonduz (no. 223).

The leaflets are similar to those of *E. lanceolata*, a species with a shallowly bilobate calyx. The fruit is quite unlike that of any other species known to the writer.

The vernacular name is given as "poró."

7. Erythrina rubrinervia H. B. K. Nov. Gen. & Sp. 6: 434. 1823.

TYPE LOCALITY: Near Fusagasuga, Colombia.

DISTRIBUTION: Oaxaca (*Nelson* 1966); Veracruz (*Nelson* 435, 79); Chiapas (*Nelson* 3842); Guatemala (*Goll* 246; *Heyde & Lux* 3293); El Salvador (*Pittier* 1930); Nicaragua (*Baker* 631); Panama (*Pittier* 2541, 6989, 4731). Also in Colombia.

Known in Guatemala as "pito."

Erythrina berteroana Urban,[1] described from Cuba and Colombia, seems to be this species. The Veracruz specimens have a slightly shorter standard than the more southern ones, but do not differ otherwise.

8. Erythrina lanceolata Standl. Contr. U. S. Nat. Herb. 17: 432. 1914.

DISTRIBUTION: Known only from the type locality, San Cristóbal de Candelaria, Costa Rica.

9. Erythrina montana Rose & Standl., sp. nov.

Stems herbaceous, from a stout elongate root, tomentulose when young but soon glabrate; leaflets suborbicular, deltoid-orbicular, or ovate-deltoid, 4 to 13 cm. long, 3 to 9 cm. wide, truncate or broadly rounded at the base, rounded to very acute at the apex, thick, bright green, concolorous, tomentulose along the veins when young, usually minutely aculeolate beneath along the veins, the venation very prominently reticulate on both surfaces; calyx 1.2 to 2.7 cm. long, thin, sparsely tomentulose or glabrate, shallowly bilobate; corolla apparently purplish green, the standard 5 to 7 cm. long, 0.8 to 1.2 cm. wide, slightly curved, glabrous; fruit 1 to 4-seeded, slightly constricted between the seeds, nearly glabrous.

Type in the U. S. National Herbarium, no. 301042, collected in the Sierra Madre, near Santa Teresa, Tepic, Mexico, August 9, 1897, by J. N. Rose (no. 2137).

ADDITIONAL SPECIMENS EXAMINED:

DURANGO: Otinapa, 1906, *Palmer* 450. Durango, 1896, *Palmer* 362. Near El Salto, July, 1898, *Nelson* 4546.

JALISCO: Chiquilistlán, May, 1892, *Jones* 180.

ZACATECAS: Near Plateado, September, 1897, *Rose* 3634. Near Monte Escobedo, August, 1897, *Rose* 3597.

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[1] Symb. Antill. 5: 370. 1908.

Because of the herbaceous habit, the prominently veined leaflets, and the form of the calyx, the proposed species is evidently related to the more southern *E. leptorhiza*. The absence of spines on the fruit is sufficient to distinguish the present plant specifically.

10. **Erythrina costaricensis** Micheli, Bull. Herb. Boiss. 2: 445. *pl. 12.* 1894.

TYPE LOCALITY: River banks near Boruca, Costa Rica.

DISTRIBUTION: Costa Rica (*Cook & Doyle* 284; *Tonduz* 12805, 13926, 10050); Panama (*Pittier* 2287, 2656; *Goldman* 1854; *Maxon* 4808; *Williams* 782).

The Costa Rican vernacular names are given as "elekeme," "coralillo," and "poro."

11. **Erythrina lanata** Rose, U. S. Dept. Agr. N. Amer. Fauna 14: 81. *fig. 1.* 1899.

TYPE LOCALITY: Acapulco, Guerrero.

DISTRIBUTION: Guerrero (*Palmer* 129, type); Oaxaca (*Nelson* 2699).

12. **Erythrina occidentalis** Standl., sp. nov.

Shrub or small tree, the branches gray, tomentulose when young, armed with numerous short stout spines, or sometimes perhaps unarmed; petioles slender, unarmed or bearing 1 or 2 short curved spines; leaflets broadly deltoid or rhombic, 5 to 17 cm. long, 4 to 12.5 cm. wide, usually truncate at the base, rarely broadly cuneate, very acute to acutish at the apex, thin, bright green above, usually somewhat paler beneath, tomentulose when young but soon glabrate; racemes dense, elongate; calyx 8 to 10 mm. long, closely white-tomentulose, obliquely truncate, the limb obscurely denticulate; standard oblong-linear, 5 to 5.5 cm. long, 7 to 8 mm. wide, thinly white-tomentulose; fruit 18 to 28 cm. long, 5 to 10-seeded, slightly constricted between the seeds, at first densely white-tomentulose but later glabrate; seeds scarlet, about 12 mm. long.

Type in the U. S. National Herbarium, no. 636555, collected along the beach at Mazatlán, Sinaloa, Mexico, March 30, 1910, by J. N. Rose, P. C. Standley, and P. G. Russell (no. 13725).

ADDITIONAL SPECIMENS EXAMINED:

SINALOA: Rosario, July, 1897, *Rose* 1822, 1592. Near Colomas, July, 1897, *Rose* 1796. Guadalupe, April, 1910, *Rose, Standley & Russell* 14732. Culiacán, October 30, 1904, *Brandegee*. La Rastra, March, 1899, *Goldman* 365.

TEPIC: María Madre Island, May, 1897, *Maltby* 127, *Nelson* 4303.

The plant is leafless at time of flowering, and none of the specimens cited show both flowers and leaves. Probably, however, all are referred here correctly, though some were referred by Rose to *E. lanata* at the time of publication of that species. The present plant is most closely related to *E. lanata*, but differs in its smaller standard, this with a much less dense indument, its larger seeds, and its less constricted pod.

13. **Erythrina herbacea** L. Sp. Pl. 706. 1753.

TYPE LOCALITY: Carolina.

DISTRIBUTION: Tamaulipas (*Palmer* 130, 328, 119, 544; *Pringle* 7687); San Luis Potosí (*Palmer* 219; *Pringle* 5123; *Rose & Hough* 4869). Also northward and eastward along the Gulf and Atlantic coasts to North Carolina.

So far as the writer knows, *E. herbacea* has not been reported previously from Mexico. All the Mexican specimens appear to have been taken from shrubs, although in many parts of its range the species is truly herbaceous, the stems dying to the ground each year. The shrubby Florida form has been

recognized as a distinct species, *E. arborea* Small,[1] but it seems to differ from typical *E. herbacea* only in habit.

14. Erythrina flabelliformis Kearney, Trans. N. Y. Acad. 14: 32. 1894.

Erythrina purpusi T. S. Brandeg. Zoe 5: 158. 1903.

TYPE LOCALITY: Near Fort Huachuca, Arizona.

DISTRIBUTION: Sonora (*Rose, Standley & Russell* 12707, 12943; *Mearns* 335, 376; *Hartman* 41); Baja California (*Nelson & Goldman* 7241, 7353); Sinaloa (*Palmer* 771); Durango (*Palmer* 179); Jalisco (*Rose & Hough* 4774, 4811; *Rose* 2887; *Pringle* 7626, 8658); Zacatecas (*Rose* 3554, 3612); Guanajuato (*Rose & Hough* 4835); San Luis Potosí (*Palmer* 686); Hidalgo (*Nelson* 3880; *Pringle* 6839; *Rose & Hay* 5301); Morelos (*Rose & Hough* 4346a). Also in southeastern Arizona and southwestern New Mexico.

15. Erythrina goldmanii Standl., sp. nov.

Branches fruticose, gray, sparsely pilose when young, armed with numerous very stout, short spines; petioles stout, bearing few stout recurved spines; leaflets rounded-ovate or suborbicular, 3.5 to 9 cm. long, 3 to 6.5 cm. wide, rounded at the base, abruptly acuminate at the apex, thick, concolorous, pilose when young but soon glabrate, the venation rather prominently reticulate, the veins armed beneath with few stout recurved spines; calyx about 1 cm. long and broad, glabrous or nearly so, somewhat obliquely truncate; standard oblong-linear, about 8 cm. long and 1 cm. wide, the wings only slightly exceeding the calyx; fruit several-seeded, 12 to 16 cm. long, deeply constricted between the seeds; seeds 9 to 10 mm. long, scarlet.

Type in the U. S. National Herbarium, no. 470671, collected at San Vicente, Chiapas, Mexico, April 20, 1904, by E. A. Goldman (no. 870).

A fruiting specimen, collected at La Razón, Chiapas, by Goldman (no. 1039), also belongs here.

Erythrina goldmanii is closely related to *E. americana*, but seems distinct in its larger flowers, deeply constricted pods, and aculeolate leaflets.

16. Erythrina americana Mill. Gard. Dict. ed. 8. *Erythrina* no. 5. 1768.

Erythrina carnea Ait. Hort. Kew. 3: 8. 1789.

TYPE LOCALITY: Veracruz.

DISTRIBUTION: Oaxaca (*Pringle* 6271; *Rose & Hough* 4627; *Conzatti* 1676); Morelos (*Rose & Hough* 4346; *Rose & Hay* 5351); Distrito Federal (*Pringle* 6838); Veracruz (*Nelson* 79); Yucatán (*Millspaugh* 306; *Schott* 831); Chiapas (*Goldman* 834); Puebla (*Arsène* 2872).

A fruiting specimen from San Luis Potosí (*Nelson* 4386) may belong here, but it has very large, thin, subattenuate leaflets; the form of the calyx is not determinable. A flowering specimen from Veracruz (*Orcutt* 3398) probably should be referred to *E. americana*, although the flowers are smaller than is usual in the species.

Erythrina coralloides DC.,[2] based upon Sessé and Mociño's plate[3] of a Mexican plant, is probably a synonym. The illustration, however, is so imperfect that it is impossible to be certain that it does not represent *E. flabelliformis*.

Specimens of *E. americana* have been determined as *E. corallodendron* L. That is a West Indian species, distinguished by a broad standard and red and black seeds.

The vernacular name in Puebla is "colorín."

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[1] Fl. Southeast. U. S. 647. 1903.

[2] Prodr. 2: 413. 1825.

[3] Calq. Dess. Fl. Mex. *pl. 253.*

DOUBTFUL SPECIES.

ERYTHRINA DIVARICATA DC. Prodr. 2: 414. 1825.

Based upon one of Sessé and Mociño's plates,[1] and said to be a Mexican plant. The standard, as illustrated, is very broad, and the plate does not agree with any material seen by the writer.

ERYTHRINA LONGIPES DC. Prodr. 2: 413. 1825.

This, too, was based upon one of Sessé and Mociño's plates.[2] The copy of the plate seen by the writer is poorly drawn, and it is impossible to place the plant with certainty.

ERYTHRINA PRINCEPS Dietr. in Otto & Dietr. Allg. Gartenz. 2: 305. 1834.

Described from Mexico. Not identifiable from the description.

ERYTHRINA ROSEA Dietr. in Otto & Dietr. Allg. Gartenz. 2: 253. 1834.

Described from Mexico. Identity doubtful.

FOUR NEW SPECIES OF CAPPARIDACEAE FROM MEXICO AND CENTRAL AMERICA.

The family Capparidaceae is extensively represented in Mexico by both herbaceous and arborescent species. One of the most interesting of these is a new genus described a few years ago by Brandegee[3] under the name *Setohellanthus*. The most noteworthy of those here described are the two species of *Forchammeria*, a very abnormal genus, concerning whose systematic position there has been great difference of opinion. *Forchammeria* is confined to Mexico, and only three older species are known.

Capparis discolor Standl., sp. nov.

Tree, 8 to 10 meters high, glabrous throughout, the branchlets slender, blackish brown; petioles slender, 2 to 7.3 cm. long; leaf blades elliptic-oblong, 10.5 to 15 cm. long, 3 to 6 cm. wide, narrowed to the obtuse base, acutely acuminate at the apex, broadest at the middle, bright green above, sublustrous, the venation prominent, closely reticulate, pale and brownish beneath, the costa and lateral nerves salient; flowers few, white, in a terminal raceme, the pedicels 3.5 to 4.3 cm. long; calyx lobes deltoid, subacute, 2 mm. long, reflexed in anthesis; petals elliptic-oblong, 12 to 15 mm. long, obtuse; stamens numerous (about 40), the filaments 3 to 4.5 cm. long, tortuous or spirally coiled, glabrous, the anthers about 2 mm. long; ovary ellipsoid, the stipe about as long as the filaments.

Type in the U. S. National Herbarium, no. 885447, collected on the banks of the Río Petatlán, Guerrero, Mexico, altitude 450 meters, November 24, 1898, by E. Langlassé (no. 558).

A species of the section *Capparidastrum*. It differs from the previously described Mexican and Central American species of that group in the very long petioles, those of the other species being only 1 cm. long or often much shorter. *C. macrophylla* H. B. K., of Colombia, also has long petioles, but the leaf blades are much larger and proportionally broader.

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[1] Calq. Dess. Fl. Mex. *pl. 256.*

[2] Calq. Dess. Fl. Mex. *pl. 254.*

[3] Univ. Calif. Publ. Bot. 3: 378. 1909.

The collector states that the native name is "naranjillo," and that the flowers have the odor of orange blossoms.

Forchammeria macrocarpa Standl., sp. nov.

Branchlets yellowish, angulate, glabrous; petioles stout, 5 to 7 mm. long, minutely pilose or glabrate; leaf blades linear, 9 to 17.5 cm. long, 5 to 7 mm. wide, gradually attenuate to the base, rarely rounded, gradually narrowed to the acute or acutish apex, coriaceous, pale green, minutely hirtellous on the upper surface or glabrate, sulcate along the costa, densely short-pilose beneath, the costa prominent, the venation closely reticulate and prominent on both surfaces but more prominent beneath, the margin revolute; pistillate racemes few-flowered, glabrous, the pedicels in fruit stout, 10 to 15 mm. long; fruit ellipsoid-globose, about 1.8 cm. long, 1.2 to 1.5 cm. in diameter, glabrous.

Type in the U. S. National Herbarium, no. 841145, collected in the vicinity of San Luis Tultitlanapa, Puebla, Mexico, in 1908, by C. A. Purpus (no. 8417).

The only other species of *Forchammeria* with linear leaves is *F. watsoni* Rose, which ranges from Sinaloa to Baja California. In that the leaf blades are almost invariably emarginate at the base, less densely pubescent, and shorter, the fruiting pedicels are scarcely half as long, and the fruit is much smaller.

Forchammeria lanceolata Standl., sp. nov.

Shrub or small tree, 3 to 4.5 meters high, glabrous throughout, the branchlets slender, grayish, with numerous prominent pale lenticels; leaves simple, the petioles 4 to 6 mm. long, the blades mostly lanceolate but varying to ovate or lance-elliptic, 6 to 8.2 cm. long, 1.7 to 3.2 cm. wide, unequal at the obtuse base, acute or acuminate at the apex, coriaceous, pale green, lustrous, the costa salient beneath, the venation prominulous and closely reticulate on both surfaces; flowers axillary, solitary, fasciculate, or in very short few-flowered racemes, the pedicels stout, 6 to 8 mm. long; fruit broadly oval, 12 to 18 mm. long, 8 to 9 mm. in diameter.

Type in the Gray Herbarium, collected somewhere in Mexico, in 1891, by C. G. Pringle (no. 3728).

Readily distinguished from the other species by the form of the inflorescence and the shape of the leaves.

Steriphoma macrantha Standl., sp. nov.

Branchlets stout, densely ferruginous-pubescent with stellate hairs; petioles slender, 4 to 10.5 cm. long, finely stellate-pubescent; leaf blades elliptic or elliptic-ovate, 14.5 to 27 cm. long, 5 to 10 cm. wide, acute or acutish at the base, narrowed to the acuminate or long-acuminate apex, membranaceous, green above, glabrous, slightly paler beneath, very sparsely and minutely stellate-pubescent or glabrate; racemes about 15 cm. long, densely many-flowered, the bractlets linear-subulate, caducous; pedicels 3 to 4 cm. long; calyx about 2 cm. long, densely orange-pubescent with close stellate hairs, the lobes acute; petals 2 to 2.5 cm. long, narrowly oblanceolate, acute or acutish; filaments 7 to 8 cm. long; carpophore about 11 cm. long, glabrate; young fruit densely stellate-puberulent.

Type in the U. S. National Herbarium, no. 716626, collected in forests around Pinogana, southern Darién, Panama, April, 1914, by H. Pittier (no. 6561).

The flowers and leaves are nearly twice as large as in the other species of the genus.

Crataeva palmeri Rose, Contr. U. S. Nat. Herb. 1: 301. 1895.

This species is distinguished from all others of the genus by the copious pubescence. The type was collected at Armeria, Colima, but the species has

a rather wide range, as shown by the following specimens in the National Herbarium.

SINALOA: Guadalupe, 1910, *Rose, Standley & Russell* 14676. Culiacán, 1910, *Rose, Standley & Russell* 14846. San Blas, 1910, *Rose, Standley & Russell* 13210. Fuerte, 1910, *Rose, Standley & Russell* 13482.

DURANGO: Without locality, August 15, 1897, *Rose.*

JALISCO: Between Bolaños and Guadalajara, September 19, 1897, *Rose.*

GUERRERO: Paso de las Vacas, 1903, *Nelson* 6973.

COLIMA: Colima, 1897, *Palmer* 117.

NEW MIMOSACEAE FROM MEXICO.

Few, if any, families of plants are represented in Mexico by a larger number of woody species than the Mimosaceae. Their study is made difficult by the fact that there are no monographic accounts available except those published by Bentham many years ago. Although Bentham's work is almost unrivaled in accuracy and lucidity, recent botanical explorations in Mexico have shown that his monographs are now too incomplete to be generally useful. There is a recent account of the genus *Mimosa*, by Robinson,[1] but there is no adequate literature covering the other groups. Eight new species of *Acacia*, one of *Calliandra*, two of *Leucaena*, and four of *Pithecollobium* are described below.

Acacia polypodioides Standl., sp. nov.

Stems slender, brown or purplish, copiously hirsute with slender stiff hairs, also puberulent and furnished with numerous minute sessile glands, unarmed; petioles 1.5 to 2.5 cm. long, hirsute and puberulent, eglandular, the pinnae 4 to 7 pairs, 2.5 to 6 cm. long; leaflets 12 to 25 pairs, oblong, 2.5 to 6 mm. long, 1 to 2.5 mm. wide, divaricate or ascending, obliquely truncate at the base, obtuse or rounded at the apex, chartaceous, dark green above, sublustrous, densely puberulent, paler beneath, densely puberulent with curved hairs or glabrate, the costa prominent beneath, the lateral nerves also usually prominulous, the margin revolute or subrevolute; flowers capitate, pedicellate, the heads axillary or short-racemose, the peduncles 1 to 1.5 cm. long, hirsute or puberulent, bracteate above the middle; calyx 0.8 mm. long, broadly campanulate, obscurely lobate, minutely pilose or puberulent; corolla 3 times as long as the calyx or longer, the lobes oblong, acute, strigose; stamens long-exserted; fruit long-stipitate, flat, 3.5 to 5.5 cm. long, 7 to 10 mm. wide, acute or abruptly short-decurrent at the base, rounded at the apex and rostrate, densely puberulent, the valves very thin.

Type in the U. S. National Herbarium, no. 470796, collected at Chiapa, Chiapas, Mexico, May 18, 1904, by E. A. Goldman (no. 1001).

The following additional collections belong here:

OAXACA: Vicinity of San Juan Guichicovi, alt. 135 to 450 meters, *Nelson* 2726. Las Pilas (Cerro Espino), alt. 400 meters, *Reko* 3612, 3755.

NICARAGUA: Granada, *Baker* 2325.

Acacia polypodioides is a member of Bentham's series *Filicinae*, and is related to *A. filicioides* (Cav.) Trel., *A. angustissima* (Mill.) Kuntze, and allied species. It is distinguished by the pubescent corolla and the peculiar

[1] Proc. Amer. Acad. 33: 305–331. 1898.

pubescence of the leaflets. The most striking character, however, which gives it an appearance decidedly different from the related species, is found in the more or less revolute margins of the leaflets. The pinnae closely resemble the fronds of certain species of *Polypodium*, hence the specific name.

Acacia leucothrix Standl., sp. nov.

Unarmed shrub, the branches stout, subtortuous, grayish, densely white-hirsute; stipules 2 to 8 mm. long, linear, persistent; petioles 3 to 7 mm. long, hirsute, eglandular, the pinnae 3 or 4 pairs, 1 to 1.5 cm. long, the rachis densely hirsute; leaflets 9 to 14 pairs, oblong or linear-oblong, 2 to 4 mm. long, 1 mm. wide or narrower, obliquely rounded at the base, rounded at the apex, chartaceous, glabrous, green above, slightly paler beneath, the costa and lateral nerves prominulous beneath, the margin plane; flowers glabrous, capitate, pedicellate, the heads axillary, solitary, the peduncles 8 to 13 mm. long, hirsute, bracteate near the apex; calyx 0.8 mm. long, broadly campanulate, obscurely lobate; corolla 3 times as long as the calyx, the lobes oblong, acute; stamens very numerous, long-exserted; fruit short-stipitate, flat, 3.5 to 5 cm. long, 6 to 7 mm. wide, attenuate to the base, rounded to acute at the apex and rostrate, glabrous, the valves very thin, prominently reticulate-veined; seeds suborbicular, subcompressed, 3 mm. long, olivaceous or grayish.

Type in the U. S. National Herbarium, no. 471006, collected at San Dieguito, San Luis Potosí, Mexico, June, 1904, by Edward Palmer (no. 143). Also collected in lowland meadows near Tampico, Tamaulipas, September 3, 1902, by C. G. Pringle (no. 9717).

Closely allied to the plant referred by Small and others to *Acacia cuspidata* Schlecht., but strikingly different in pubescence.

Acacia laevis Standl., sp. nov.

Stems slender, terete, purplish brown, glabrous, unarmed; stipules 4 to 5 mm. long, linear, hirsute-ciliate; petioles 4 to 6 cm. long, without glands; pinnae 8 to 11 pairs, the leaflets about 30 pairs, oval or oblong-oval, 3 to 5.5 mm. long, 1.5 to 2.8 mm. wide, obliquely semicordate at the base, rounded or very obtuse at the apex, subcoriaceous, glabrous, green above, the venation mostly plane, paler beneath, the venation prominent and laxly reticulate, the margin plane, appressed-ciliolate; flowers capitate, pedicellate, the heads partly axillary and partly in a long naked raceme, the peduncles 2 to 2.5 cm. long, fasciculate, glabrous, the bracts small, linear; flowers glabrous, the calyx about 1 mm. long, companulate, truncate, the corolla 3 mm. long; stamens very numerous, long-exserted; fruit (immature) about 5.5 cm. long and 8 mm. wide, long-stipitate, attenuate to the base, rounded and rostrate at the apex, glabrous, glaucescent, the valves very thin.

Type in the U. S. National Herbarium, no. 296758, collected near Guadalajara, Jalisco, Mexico, July 21, 1902, by C. G. Pringle (no. 11354).

Closely related to *A. tequilana* S. Wats., and perhaps only a form of that species. In *A. tequilana*, however, the pinnae are only 3 to 5 pairs, and the leaflets several times as large and much broader in outline.

Acacia penicillata Standl., sp. nov.

Stems slender, terete, purplish and glaucescent, glabrous, unarmed; stipules linear, about 4 mm. long; petioles 4.5 to 9 cm. long, glabrous, eglandular, the pinnae 3 to 5 pairs; leaflets 15 to 30 pairs, oblong-oval, 6 to 14 mm. long, 3.5 to 8 mm. wide, obliquely semicordate at the base, broadly rounded at the apex, chartaceous, glabrous, dark green or at first glaucescent above, paler beneath, the venation prominulous-reticulate, the margin plane, appressed-ciliolate; flowers capitate, pedicellate, the heads arranged in a long raceme, the peduncles

fasciculate, 2.5 to 4 cm. long, glabrous, the bracts ovate-oblong, 4 to 5 mm. long; flowers glabrous, the calyx campanulate, shallowly lobate, glaucescent, the corolla 3.5 to 4 mm. long, the lobes ovate, obtuse; stamens very numerous, long-exserted; fruit long-stipitate, 6.5 to 8.5 cm. long, 0.9 to 1.3 cm. wide, straight, flat, acute or attenuate at the base, rounded and rostrate at the apex, glabrous, glaucescent, the valves thin, reticulate-veined; seeds brown-olivaceous, 5 mm. long, 4 mm. wide, compressed, smooth.

Type in the U. S. National Herbarium, no. 371953, collected on Cerro de San Felipe, Oaxaca, Mexico, altitude 2,000 meters, August 29, 1897, by C. Conzatti and V. González (no. 564).

The description of the fruit is based upon a specimen collected somewhere in Jalisco, in 1897, by J. N. Rose (no. 3008a). It is possible that this collection is not conspecific with the type.

Acacia penicillata, like *A. laevis*, described above, is closely related to *A. tequilana*, and perhaps only an extreme variant of it. The leaflets are so much smaller and narrower in the present plant, however, that it seems probable that it is specifically different.

Acacia conzattii Standl., sp. nov.

Branches slender, dark gray or brownish, with many small pale lenticels, hirtellous when young, armed with numerous pairs of stipular spines, these stout, straight, 0.8 to 3.3 cm. long, connate at the base; petioles slender, 1.5 to 2.5 cm. long, sparsely and minutely hirtellous or glabrate, with an excavate gland near the base; pinnae one pair, the leaflets 2 pairs (the lower leaflets alternate), oblong, oblong-obovate, or ovate, the terminal ones asymmetric, obtuse or rounded at the unequal base, rounded to acute at the apex, mucronulate, chartaceous, bright green, with prominent or prominulous venation, minutely pilose beneath along the costa but elsewhere glabrous; flowers spicate, sessile, the spikes dense, 2 to 5 cm. long, the peduncle very short, pilose, subtended at the base by a tubular-campanulate involucel; bractlets filiform-spatulate, minutely pilose; calyx half as long as the corolla, puberulent on the upper part; stamens numerous, long-exserted.

Type in the U. S. National Herbarium, no. 572217, collected at Estación Almoloyas, Oaxaca, Mexico, altitude 700 meters, March, 1907, by C. Conzatti (no. 1756).

Related to *Acacia pringlei* Rose, a species distinguished from the present plant by its short spines and large, proportionally broader leaflets.

Acacia sororia Standl., sp. nov.

Branches stout, terete, dark gray or blackish, with few scattered stout spines 2 mm. long, the young branches densely cinereo-puberulent; petioles stout, 6 to 15 mm. long, with a large excavate gland at the apex; rachis of the leaves densely pilose with minute whitish hairs, the pinnae 2 or 3 pairs; leaflets 1 or 2 pairs, sessile, obliquely oval, suborbicular, or flabellate-orbicular, 0.9 to 2.5 cm. long, 0.7 to 2 cm. wide, rounded and very unequal at the base, broadly rounded at the apex, thick-coriaceous, densely cinereo-puberulent, palmately nerved, the venation prominent, especially beneath; flowers spicate, sessile, the spikes 1.3 to 2 cm. long, the peduncles solitary, 1.5 to 2.5 cm. long, densely and minutely pilose; calyx densely and minutely pilose; fruit stipitate, 4.5 to 8 cm. long, 1.5 to 2.5 cm. wide, straight or slightly curved, densely cinereo-puberulent, the stipe stout, 5 to 10 mm. long, the valves thick and hard, abruptly decurrent into the stipe, rounded and rostrate at the apex, usually slightly constricted between the seeds, the edges thickened; seeds 3 or 4, ovate-orbicular, strongly compressed, about 13 mm. long and 11 mm. wide, dark castaneous.

Type in the U. S. National Herbarium, no. 453250, collected near Higuerillas, Querétaro, Mexico, August 28, 1905, by J. N. Rose, J. H. Painter, and J. S. Rose (no. 9761). Also collected at the same place, on the same date, by F. Altamirano (no. 1668).

The only closely related Mexican acacia is *A. reniformis* Benth., described from the same general region, a species not represented in the National Herbarium. It is possible that *A. sororia* is only a form of *A. reniformis*, but Bentham's excellent description and illustration indicate several important differences. *A. reniformis* is described as "undique glaberrima"; the flowers are pedicellate and glabrous; and the pinnae are only one or two pairs, each with a single pair of leaflets. The stipules, too, are large and reniform and persistent, while in the specimens of *A. sororia*, although some of the leaves are immature, the stipules have all fallen.

Acacia rosei Standl., sp. nov.

Branchlets brown, glabrous or sparsely puberulent, unarmed; petioles 2 to 4 cm. long, without a large gland but with numerous minute ones, these scarcely elevated; rachis of the leaf (when present) 1.5 to 2.5 cm. long, the pinnae 1 or 2 pairs, the leaflets 2 or 3 pairs, oval, oval-elliptic, or ovate-oval, the terminal ones slightly asymmetric, 2.5 to 5 cm. long, 1.4 to 2.5 cm. wide, rounded at the base, obtuse or rounded at the apex, chartaceous, with prominent or prominulous venation, green above, pale beneath, with a few short scattered hairs along the veins, elsewhere glabrous, the margin plane or subrevolute, ciliolate; flowers white, pedicellate, capitate, the heads few, paniculate, the penduncles shorter than the heads, puberulent; calyx puberulent; corolla glabrous, 3 times as long as the calyx; stamens very numerous; fruit slender-stipitate, straight, the valves very thin, 3 to 4.5 cm. long, 0.9 to 1.4 cm. wide, acute at the base, rounded and rostrate at the apex, brown, prominently reticulate-veined; seeds olivaceous, 3.5 to 4 mm. long, very slightly compressed.

Type in the U. S. National Herbarium, no. 636502, collected on Observatory Hill, Mazatlán, Sinaloa, Mexico, March 30, 1910, by J. N. Rose, P. C. Standley, and P. G. Russell (no. 13673).

Because of the pedicellate flowers and the absence of petiolar glands it is evident that this plant belongs to the series *Filicinae* of Bentham, but it is not closely related to any of the described species of that group. It somewhat resembles *A. crinita* T. S. Brandeg., a species of the same region, notable for its hispid stems.

Acacia vernicosa Standl., sp. nov.

Shrub, 1 to 2 meters high, viscid throughout with minute glands, these not at all elevated, the branches reddish brown, glabrous or nearly so, armed with numerous stipular spines, these stout, gray or white, 0.5 to 1.6 cm. long; petioles 3 to 7 mm. long, usually with a minute gland at the apex, the pinnae 1 or 2 (very rarely 3) pairs; leaflets 7 to 9 pairs, oval or oval-oblong, 1.2 to 3 mm. long, 0.5 to 1.2 mm. wide, rounded at each end, very thick, extremely viscid, glabrous, plane, the venation obscure; inflorescence capitate, dense, the peduncles axillary, 1 to 2 cm. long, usually glabrous, the small involucel borne at or above the middle; flowers glabrous, yellow; fruit 4 to 7 cm. long, 2.5 to 4 mm. wide, dehiscent, the valves thin, convex, brown, lustrous, more or less constricted between the seeds; seeds oblong, 4 to 6 mm. long, gray, spotted with black.

Type in the U. S. National Herbarium, no. 573848, collected in the vicinity of Santa Rosalia, Chihuahua, Mexico, altitude about 1,200 meters, June, 1908, by Edward Palmer (no. 385).

The following additional specimens are in the National Herbarium:

TEXAS: El Paso, *Jones* 4218, *Stearns* 77; in 1881, *Vasey*. Del Rio, June 13, 1891, *Dewey*. Kent, *Tracy & Earle* 411. Mouth of Pecos River, *Bailey* 269. Boquillas, *Bailey* 356.

NEW MEXICO: Tortugas Mountain, *Standley* 6446. Mesa west of Organ Mountains, *Wooton* 129; June 13, 1906, *Standley;* August 19, 1906, *Wooton & Standley*. La Luz Canyon, August 27, 1901, *Wooton*. Lake Valley, 1914, *Mrs. Ida M. Beals*. North of Emory Peak, *Mearns* 305. Without locality, *Vasey* 130. Big Hatchet Mountains, *Goldman* 1342. Eddy, *Bailey* 142.

ARIZONA: Near Fort Huachuca, *Wilcox* 415, 181. Huachuca Plains, *Lemmon* 156. San Bernardino Ranch, *Mearns* 711.

CHIHUAHUA: Near Chihuahua, *Palmer* 116; *Rose & Hough* 4216; *Pringle* 370. Sabina, *Rose & Hay* 5264. Between Casas Grandes and Sabinal, *Nelson* 6370.

ZACATECAS: Cañitas, *Rose & Hay* 5266.

QUERÉTARO: Near Higuerillas, *Rose, Painter & Rose* 9762. Between Vizarrón and Higuerillas, *Altamirano* 1696.

Part of the material distributed as *Wright* 1050 and *Mexican Boundary Survey* 327 also belongs to this species.

The material here segregated as *Acacia vernicosa* has always been referred to *A. constricta* Benth. The two species are closely related and do not have separate ranges, but at the same time they seem to be clearly distinct. In *A. constricta* the pinnae are 4 to 9 pairs, the leaves are usually pubescent, and the leaflets are almost twice as large and very slightly or not at all viscid. Bentham evidently had both plants before him when the description of *A. constricta* was written, for he states[1] that the leaves of the sterile branches are more luxuriant, puberulent, with 4 to 6 pairs of pinnae, while those of the flowering branches are glabrous, with usually 2 pairs of pinnae. The writer is unable to find any indication that the difference in number of pinnae may be explained in this way. All the numerous specimens examined are clearly of one form or the other, and the two species are found associated on only one sheet, consisting of specimens collected by Wright (no. 1050). In this case, and in view of the method by which Wright's collections were distributed, it seems not improbable that the two plants came from widely separated localities.

Because of the fact that Bentham's description was based upon material of both species, there is naturally some question as to which should be taken as the type. The writer has arbitrarily chosen for that purpose the form with numerous pinnae, which has a rather wider distribution than *A. vernicosa*. The specimen of the type collection (*Wright* 162) in the National Herbarium consists of a single fruiting branch of this form.

Calliandra conzattii Standl., sp. nov.

Branches slender, grayish; petioles 6 to 12 mm. long; pinnae a single pair, the rachis slender, 2 to 4 cm. long, densely hirtellous; leaflets 5 or 7, ovate, elliptic, or elliptic-oblong, 2.2 to 6.2 cm. long, 1 to 2.5 cm. wide, the lower ones much smaller than the upper, rounded or very obtuse at the oblique base, usually acute but sometimes obtuse at the apex, subchartaceous, bright green, puberulent or hirtellous on the costa, but elsewhere glabrous, the venation prominulous; flowers capitate, sessile, the heads sessile, solitary, the bracts puberulent; calyx 1 mm. long, campanulate, puberulent; corolla 4 to 5 mm. long, greenish, sparsely puberulent above, the lobes very short, ovate, obtuse; stamen tube short-exserted.

[1] Pl. Wright. 1: 67. 1852.

Type in the U. S. National Herbarium, no. 763864, collected along the Río de Pilas, Distrito de Pochutla, Oaxaca, Mexico, altitude 300 meters, April 27, 1917, by C. Conzatti (no. 3191).

Not closely related to any species of *Calliandra* previously reported from Mexico. In the absence of fruit it is impossible to be certain that the plant is not a *Pithecollobium*, but if so it can not be referred to any of the described species.

Leucaena cuspidata Standl., sp. nov.

Branches slender, subterete, reddish brown, glabrous; stipules 2 to 3 mm. long, ovate or deltoid-ovate, cuspidate; petioles 1.5 to 2.5 cm. long, with a depressed circular gland at the apex, the rachis 3 to 8 cm. long, glabrous, the pinnae 5 to 9 pairs, 4 to 7 cm. long, their rachises glabrous or at first sparsely pilose; leaflets 15 to 40 pairs, sessile, ovate-oblong, most of them about 4.5 mm. long and 2.2 mm. wide, obliquely rounded or truncate at the base, rounded or obtuse and cuspidate at the apex, coriaceous, glabrous, dark green on the upper surface, the venation plane or prominulous, much paler beneath, the venation prominent, the margin plane; peduncles axillary, 2 to 3.5 cm. long, glabrous, involucellate above the middle, the flowers sessile in a globose head 7 to 8 mm. in diameter; calyx 2 mm. long, shallowly dentate, glabrous or puberulent above; corolla 3 mm. long, glabrous; anthers short-exserted, glabrous; immature fruit sessile or nearly so, attenuate to the base, glabrous.

Type in the U. S. National Herbarium, no. 463766, collected at Minas de San Rafael, San Luis Potosí, Mexico, May, 1911, by C. A. Purpus (no. 5183).

The coriaceous, cuspidate leaflets, with prominent venation, are quite unlike those of any of the described species.

Leucaena plurijuga Standl., sp. nov.

Branches brown, terete, minutely puberulent when young, furnished with numerous small pale lenticels; stipules deciduous; petioles 3.5 to 5 cm. long, minutely puberulent or glabrate, furnished near the base with a large depressed oblong gland, the rachis 3 to 9.5 cm. long, the pinnae 3 to 5 pairs, 5 to 10 cm. long, leaflets 5 to 9 pairs short-petiolulate, oblong or elliptic-oblong, sometimes oblong-obovate, usually subfalcate and asymmetric, 1.4 to 5.2 cm. long, 0.7 to 1.5 cm. wide, rounded and more or less oblique at the base, rounded or very obtuse at the apex and apiculate, chartaceous, green above, minutely appressed-pilose when young, the venation prominulous, paler beneath, sparsely and minutely pilose when young but soon glabrate, the venation prominent-reticulate, the margin plane; peduncles axillary, 3 to 3.5 cm. long in fruit; fruit oblong-linear, about 24 cm. long and 4.3 cm. wide, acute at the base, acuminate at the apex, glabrous, the valves thin, brown, the stipe about 2 cm. long; seeds about 1 cm. in greatest diameter, flat, brown, smooth, sublustrous.

Type in the U. S. National Herbarium, no. 246386, collected at Monte León, Michoacán, Mexico, November 12, 1892, by C. G. Pringle (no. 5352).

Also collected near Querétaro, August, 1906, by J. N. and J. S. Rose (no. 11173). A sterile specimen collected at Celaya, Guanajuato, in 1897, by J. N. Rose (no. 3073), is probably of this species.

Related to *Leucaena macrophylla* Benth. and *L. macrocarpa* Rose, both of which differ in their less numerous pinnae and leaflets.

Pithecollobium leiocalyx Standl., sp. nov.

Younger branches brownish, puberulent at first, with numerous pale lenticels, furnished with few short stout straight ascending spines; petioles slender, 1.2 to 1.7 cm. long, with a small crateriform gland near the base, the rachis 6 to

14 mm. long, minutely pilose; pinnae 2 or 3 pairs, the leaflets 3 to 5 pairs, oval to broadly oblong, 7 to 14 mm. long, 3.5 to 7 mm. wide, rounded and oblique at the base, rounded at the apex, chartaceous or subcoriaceous, pilose with very short subappressed hairs or finally glabrate, green above, pale beneath, the margin plane; flowers capitate, sessile, the heads few-flowered, the peduncles 2.5 to 3 cm. long; calyx 7 to 8 mm. long, glabrous, the lobes oblong-ovate, variable in length, ciliate; corolla about 1.5 cm. long, copiously white-pilose above the calyx, the lobes lance-oblong, acute, about half as long as the tube; stamens very long, the tube exserted 1 to 1.5 cm.

Type in the U. S. National Herbarium, no. 567316, collected at Salina Cruz, Oaxaca, Mexico, April 28, 1910, by C. R. Orcutt (no. 3288).

Although the material at hand is rather imperfect, this plant seems sufficiently distinct to deserve recognition as a species. It is related, evidently, to *P. acatlense* Benth., but in that the calyx is densely pilose, the peduncles are very short, and the numerous leaflets are much smaller and proportionately narrower.

Pithecollobium calostachys Standl., sp. nov.

Tree, 4.5 to 6 meters high or larger, the younger branches green or grayish, conspicuously lenticellate, pubescent at first, armed with numerous short, stout, ascending or subdivaricate spines; petioles 0.6 to 4.5 cm. long, slender, glabrous or nearly so, bearing a low gland at the apex; pinnae one pair, the rachis 0.6 to 2.5 cm. long, the leaflets a single pair to each pinna, oblique, ovate to oblong or oval-ovate, 3 to 11 cm. long, 1.3 to 6 cm. wide, rounded or obtuse at the base and very unequal, narrowed to the obtuse or acute apex, thick-chartaceous, bright green, glabrous or nearly so, the venation prominent or prominulous on both surfaces; inflorescence spicate, the spikes dense, 2.5 to 7.5 cm. long, on long or short peduncles, axillary or usually paniculate, the rachis densely puberulent, the bracts linear-lanceolate, 2 to 3 mm. long, divaricate or reflexed, puberulent; calyx 2.5 to 3 mm. long, tubular-campanulate, pilose with minute, mostly appressed hairs; corolla 5 to 6 mm. long, sericeous, the lobes oblong-ovate, acute, about half as long as the tube; stamen tube much exserted, usually twice as long as the corolla or longer; fruit curved or coiled, glabrous, the valves 1.5 to 2 cm. wide, contorted after dehiscence, convex, very thick (6 to 8 mm.) and hard.

Type in the U. S. National Herbarium, no. 463247, collected in the vicinity of Tampico, Tamaulipas, Mexico, altitude about 15 meters, April, 1910, by Edward Palmer (no. 307).

The following additional specimens are in the National Herbarium:

TAMAULIPAS: Tampico, *Pringle* 7681; May, 1910, *Palmer*. Gómez Farias, *Palmer* 282.

SAN LUIS POTOSÍ: Tancanhuitz, alt. 360 meters, *Nelson* 4372. Without locality (perhaps from Tamaulipas), *Palmer* 1061.

VERACRUZ: Carrizal, *Goldman* 702, 703.

TABASCO: Mayito, *Rovirosa* 112.

OAXACA: Chivela, *Orcutt* 3189.

CHIAPAS: Tapachula, *Nelson* 3852.

This plant has always been confused with *P. lanceolatum* (Humb. & Bonpl.) Benth. (*P. ligustrinum* Benth.), a species described from Venezuela. The latter ranges northward from Venezuela and Colombia to Mexico, but in Mexico it is confined chiefly to the west coast, while *P. calostachys* is most abundant on the east coast. *P. lanceolatum* is distinguished from the species here described as new by the very short, triangular bracts and the included or short-exserted stamen tube. Its leaflets, too, are usually more obtuse at the apex, and the

valves of the fruit, in the few fruiting specimens examined, are much narrower and thinner.

Pithecollobium macrosiphon Standl., sp. nov.

Young branches green or gray, puberulent at first, roughened by numerous pale lenticels, furnished with short ascending straight spines; petioles stout, 1.5 to 4.8 cm. long, with a low crateriform gland at the apex; pinnæ a single pair, the rachises 4 to 13 mm. long; leaflets a single pair, short-petiolate, the blades obliquely elliptic, elliptic-oblong, or elliptic-oval, 3 to 7 cm. long, 1.5 to 3.8 cm. wide, rounded or very obtuse at the base and unequal, obtuse or very obtuse at the apex, mucronulate, subcoriaceous, brownish, especially beneath, glabrous, the venation prominent or prominulous on both surfaces; flowers spicate, the spikes 5 to 6 cm. long, very dense, the bracts deltoid, minute; calyx 1 to 1.2 mm. long, campanulate, puberulent; corolla 6 to 6.5 mm. long, minutely sericeous, the lobes oblong-ovate, acute, about half as long as the tube; stamen tube exserted 11 to 15 mm.; valves of the fruit (a single imperfect fruit seen) 1.5 to 1.8 cm. wide, very thick and hard, somewhat contorted after dehiscence; seeds 1.2 to 1.5 cm. long, compressed, dark brown, with a very large fleshy aril.

Type in the U. S. National Herbarium, no. 252398, collected between Tumbala and El Salto, Chiapas, Mexico, October 29, 1895, by E. W. Nelson (no. 3398).

Related to *P. lanceolatum* (Humb. & Bonpl.) Benth., and to *P. calostachys*, described above, but distinguished from both by the very short calyx. The stamen tube, also, is much longer than in any of the related species.

Pithecollobium confine Standl., sp. nov.

Densely branched shrub, 1 to 1.5 meters high, or sometimes a small tree, with very stout, grayish, flexuous or contorted branches, armed with numerous short stout straight spines; leaves clustered on short lateral spurs, the petiole 4 to 15 mm. long, puberulent, bearing a low gland at the apex between the lowest pair of pinnae, the pinnae usually one but sometimes 2 pairs, the rachis, if any, very short, the leaflets 3 to 5 pairs, oblong-oval to rounded-oval or broadly cuneate-obovate, 4.5 to 10 mm. long, 2.5 to 7 mm. wide, rounded or very obtuse at the unequal base, rounded to truncate at the apex, subcoriaceous, puberulent when young but usually soon glabrate, the venation commonly prominulous; inflorescence capitate, the heads globose, the peduncles mostly solitary and axillary, 5 to 10 mm. long, puberulent; calyx 1 to 1.2 mm. long, campanulate, puberulent; corolla 2.5 mm. long, purplish, the tube glabrous, the lobes ovate, obtuse, puberulent, less than half as long as the tube; stamens numerous, the tube included; fruit about 10 to 14 cm. long and 2.5 to 3 cm. wide, densely puberulent when young, black in age, the outer coat breaking into numerous irregularly angulate plates, the valves becoming very thick, hard, and woody, usually curved, convex, tardily separating; seeds usually 5 to 10, variously compressed, 10 to 18 mm. in greatest diameter, dark brown, smooth.

Type in the U. S. National Herbarium, no. 638896, collected at Cape San Lucas, Baja California, Mexico, March 23, 1911, by J. N. Rose (no. 16389).

The following additional specimens have been examined:

BAJA CALIFORNIA: Cape San Lucas and vicinity, *Xantus* 38. Los Angeles Bay, *Palmer* 548. La Paz, *Palmer* 86. San José del Cabo, *Rose* 16444. Catalina Island, *Rose* 16887. Cerralvo, *Rose* 16896. Agua Colorada to Cerro Colorado, *Nelson & Goldman* 7316.

This plant has been referred to *P. flexicaule* (Benth.) Coult., but in that the inflorescence is spicate and the pinnae are usually more numerous. The latter species is known in Mexico only from Tamaulipas and Nuevo León.

The common name is said to be "palo fierro."

TWO NEW SPECIES OF CALOPHYLLUM FROM MEXICO.

The genus *Calophyllum* of Linnaeus is composed of about 50 species, natives chiefly of tropical Asia and Africa. Vesque, in his monograph of the genus,[1] reports only four species from the Western Hemisphere: *C. calaba* Jacq., of the West Indies; *C. brasiliense* Camb., ranging from Brazil to Panama; *C. lucidum* Benth., of the Guianas; and *C. pachyphyllum* Triana & Planch., of Brazil. The recent discovery of two species in southern Mexico indicates that the range of the genus extends farther north than had been believed previously.

Calophyllum rekoi Standl., sp. nov.

Tree, 20 to 25 meters high, the branchlets stout, angulate and plicate-striate, pruinose-puberulent at first but soon glabrate, the internodes elongate; petioles stout, 2.2 to 3.2 cm. long, sulcate on the upper side, rounded beneath; leaf blades elliptic or narrowly elliptic-oblong, 10.5 to 16 cm. long, 4.3 to 6 cm. wide, obtuse or acute at the base, acutish or obtusely short-acuminate at the apex, coriaceous, lustrous above, the costa impressed near the base, prominent toward the apex, dull beneath, the costa salient, the lateral nerves very numerous, approximate, parallel, prominulous, the margin thickened; racemes axillary, mostly 7-flowered, 2.5 to 3.5 cm. long, short-pedunculate, the rachis and pedicels puberulent, the latter stout, 2.5 to 5 mm. long; bracts minute, caducous; polygamous flowers 8 mm. broad, the sepals 4, reflexed, oval, more or less cucullate, the 2 inner ones petaloid, the petals wanting; stamens 7 to 12, the anthers 1.5 to 2 mm. long; ovary globose, the stigma peltate, irregularly lobed.

Type in the U. S. National Herbarium, no 842605, collected at Cafetal Concordia (Cerro Espino), Oaxaca, Mexico, November 18, 1917, by B. P. Reko (no. 3557).

This species is related to *C. brasiliense*, but is distinguished by the long petioles (twice as long as the latter species) and by the puberulent inflorescence. The vernacular names are given as "cimarrón" and "cedro cimarrón."

Doctor Reko furnishes the following additional notes regarding the plant: "A most beautiful tree, about 20 to 25 meters high, growing very commonly here in nearly all the cafetales, at an altitude of about 600 to 800 meters, and highly appreciated on account of its excellent wood, which resembles mahogany. It is hardly possible to believe that such a tree should still be unknown in Mexico, and only the great difficulty in discovering the small, white flowers so high up in the foliage of the tree would account for it. The tree, when cut, produces a yellow, sticky sap, something similar to the 'chicle,' and is used as 'leche María' by the Indians. The flowers are very fragrant. The fruit is spheric, of the size of a walnut (4 to 5 cm.)."

Calophyllum chiapense Standl., sp. nov.

Branches thick, grayish, the branchlets very stout, pruinose-puberulent at first but soon glabrate, densely leafy; petioles stout, 8 to 10 mm. long, sulcate on the upper surface, rounded beneath; leaf blades elliptic or obovate-elliptic, 6.5 to 8.5 cm. long, 2.2 to 4 cm. wide, acute or cuneate at the base, obtuse or acutish at the apex, coriaceous, glabrous, lustrous above, the costa sulcate near the base, prominulous toward the apex, the lateral nerves very numerous,

[1] In DC. Monogr. Phan. 8: 529–610. 1893.

approximate, parallel, prominulous, slightly paler beneath and dull, the costa salient, the lateral nerves prominulous, the margin thickened; racemes axillary, mostly 5-flowered, short-pedunculate, about 2.5 cm. long, the rachis and pedicels obscurely puberulent, the latter 2 to 4 mm. long, stout, opposite, the bracts minute, deciduous; polygamous flowers 8 to 10 mm. broad, the sepals 4, more or less cucullate, minutely scaberulous on the margins; stamens numerous.

Type in the U. S. National Herbarium, no. 860362, collected at Los Pinos, near Tonalá, Chiapas, Mexico, December 13, 1906, by G. N. Collins and C. B. Doyle (no. 59).

Calophyllum chiapense is related to some of the forms of *C. brasiliense*, but is distinguished by the smaller, relatively narrower leaf blades, these being usually broadest slightly above the middle. In the latter species, too, the racemes are usually much longer and the flowers smaller.

The present species is known in Chiapas as "leche de María." The wood is used for making cart wheels.

THREE NEW SPECIES OF EBENACEAE FROM TROPICAL AMERICA.

In the last paper of this series the writer described five new species of *Maba* and *Diospyros* from Mexico. The three following ones are based upon additional material now available for study.

Maba nicaraguensis Standl., sp. nov.

Tree, 4.5 to 6 meters high, with a short trunk and dense rounded crown; branches grayish, the branchlets densely puberulent; petioles stout, 5 to 6 mm. long, densely fulvous-pilose with short hairs; leaf blades oblong or oblong-obovate, 5.5 to 8 cm. long, 2.2 to 3.3 cm. wide, rounded to cuneate at the base, obtuse or acutish at the apex, coriaceous, grayish green above, velvety-pilose with short grayish hairs, the costa plane, the lateral veins inconspicuous, brownish beneath, copiously pilose with short slender hairs, the costa and lateral veins prominent, the latter about 7 on each side, irregular, the transverse veins prominulous, laxly reticulate, the margin plane or subrevolute; fruit globose, about 2.2 cm. in diameter, umbonate, densely fulvous-sericeous near the apex, subsessile, solitary; calyx trilobate to the middle, about 2 cm. broad, densely fulvous-tomentulose, the lobes broadly rounded, reflexed.

Type in the U. S. National Herbarium, no. 862725, collected on dry hills, Granada, Nicaragua, February 16, 1903, by C. F. Baker (no. 629).

This is the first species of *Maba* to be reported from Central America. It is related, perhaps, to *M. albens* (Presl) Hiern, a species with thin leaves, canescent-tomentulose beneath.

Maba rekoi Standl., sp. nov.

Branchlets brown, rimose, densely fulvous-pilose when young with short hairs, glabrate in age; petioles stout, 4 to 5 mm. long, hirtellous; leaf blades oval or oval-oblong, 10 to 11 cm. long, 5 to 5.5 cm. wide, rounded at the base, very obtuse or rounded at the apex, chartaceous, bright green above, minutely pilose or glabrate, the costa impressed, grayish green beneath, minutely pilose with spreading hairs, the costa and lateral veins very prominent, the latter 6 or 7 on each side, arcuate, the transverse veins prominent, laxly reticulate, the margin subrevolute; fruit globose, 1.5 to 2 cm. in diameter, glabrous, short-pedunculate, solitary; calyx deeply 3-lobate, 1.5 to 2 cm. broad, densely puberulent, the lobes broadly rounded, reflexed.

Type in the U. S. National Herbarium, no. 842523, collected at Puerto Angel, Oaxaca, Mexico, September 28, 1917, by B. P. Reko (no. 3429).

The leaves are larger than in any other Mexican species. *Maba latifolia* Standl. is closely related but is distinguished by its small, coriaceous, rugose leaves.

Diospyros oaxacana Standl., sp. nov.

Branches grayish, the branchlets slender, densely brownish-pilose, the pubescence persistent; petioles stout, 2 to 3 mm. long, densely pilose; leaf blades oblong, obovate-oblong, or elliptic-oblong, 4 to 7.5 cm. long, 2.8 to 4 cm. wide, rounded or obtuse at the base, rounded at the apex, chartaceous, green above, velutinous-pilose with short hairs or in age glabrate, paler beneath, densely short-pilose, the margin subrevolute; pistillate flowers solitary, the fruiting peduncles about 1 cm. long; pistillate calyx 5-parted to the base, short-pilose, the lobes linear-oblong, 1 to 1.5 cm. long, widest toward the apex, obtuse or rounded; immature fruit subglobose, 1.5 cm. in diameter, glabrous.

Type in the U. S. National Herbarium, no. 381771, collected at Cuicatlán, Oaxaca, Mexico, altitude 600 meters, September 16, 1899, by V. González (no. 982).

Because of the glabrous fruit it is probable that this species belongs to the section *Danzleria*. Two Mexican species, *D. palmeri* Eastw. and *D. blepharophylla* Standl. (*D. ciliata* A. DC.), have glabrous fruit (and ovary), but they differ from the present plant in having glabrous leaves.

THE PANAMANIAN SPECIES OF LEIPHAIMOS.

The species of this genus form one of the most interesting groups of tropical American plants. They are parasites or saprophytes, without chlorophyll, resembling in general appearance the Orobanchaceae or even some of the saprophytic Orchidaceae and Burmanniaceae. They have a comparatively simple structure, but vary widely in the form of the flowers, the shape of the corolla and calyx and the structure of the stamens affording excellent characters for specific segregation. The flowers are usually small, the largest, perhaps, being those of one of the Panamanian species, *L. pulcherrimus*, whose corolla has a length of nearly 3.5 cm. and a breadth of 2 to 2.5 cm. The corolla is commonly bright-colored, of various shades of blue, yellow, or purplish red, but is often white or cream-colored.

Until recently the species of *Leiphaimos* have been included in the genus *Voyria*. The treatment adopted here is that followed by Gilg in his account of the Gentianaceae in Engler and Prantl's Natürlichen Pflanzenfamilien.[1] *Voyria*, as limited by Gilg, is characterized by the dehiscence of the capsule, which is apical rather than lateral as in *Leiphaimos*. In the former the pollen grains are elongate and curved, while in *Leiphaimos* they are ovoid. Gilg remarks that the two genera are far removed from each other in many points. To *Voyria* Gilg refers 8 species, all from the Guianas. These form a homogeneous group, closely resembling one another in habit.

[1] 4: 50–108. 1895.

Leiphaimos was based by Schechtendal and Chamisso in 1831 upon a plant collected by Schiede and Deppe upon rotten logs in the forests of Papantla, Mexico. The original species, *Leiphaimos parasiticus*, has the most northern range and possibly the widest distribution of any plant of the genus, occurring from southern Mexico to the West Indies and the keys of Florida. Five other generic names have been published which, for the present, are considered synonyms of *Leiphaimos*. *Ciminalis* of Rafinesque[1] contained 3 species which are said to be synonyms of *Leiphaimos aphyllus*, the earliest published species of the group, described by Jacquin in 1760 as *Gentiana aphylla*.[2]

Leianthostemon of Miquel[3] was based upon two closely related species with corymbose inflorescence. Miquel describes two other genera at the same time, *Disadena*[4] and *Pneumonanthopsis*.[4] The first, under which he described a single species, *D. flavescens*, is the name to be used for those species having glanduliferous ovaries, should it ever be deemed necessary to resegregate them as a distinct genus. *Pneumonanthopsis* consisted of two species of rather diverse form. *Biglandularia* of Karsten,[5] like *Disadena*, was based upon a plant with gland-bearing ovaries, *B. azurea* (*Leiphaimos azureus* Gilg), one of the species listed here from Panama.

It seems to the writer that it will probably be necessary later to resurrect some of these names and to form several additional genera. The plants composing the genus vary greatly in general appearance as well as in floral structure, variations more conspicuous than those separating most of the genera of the Gentianaceae. So little material exists in herbaria, however, and this often incomplete, that it does not seem wise to attempt generic segregations at present. From the nature of the plants the species must have a localized distribution, and few of them are known from more than a single collection. They are said to be represented by only a few individuals, and these usually widely separated, in a given locality.

Leiphaimos has a rather wide distribution in tropical America, extending from Mexico and the keys of Florida, through the West Indies, to Bolivia and central Brazil. Two species have been described from tropical western Africa.[6]

There is at least one good monograph of the genus, and many of the species have been illustrated. Grisebach, in his Genera et Species Gentianearum, in 1839, lists seven species, with keys and descriptions. In the next year Splitgerber published a revision of the group, de-

[1] Fl. Tellur. 3: 19. 1836.
[2] Enum. Pl. Carib. 17.
[3] Stirp. Surin. Sel. 147. 1850.
[4] Stirp. Surin. Sel. 150. 1850.
[5] Linnaea 28: 416. 1856.
[6] Baker, Kew Bull. 1894: 25, 26. 1894.

scribing four new species,[1] which are well illustrated with hand-colored plates. The best monograph of *Voyria* (including *Leiphaimos*) is that of Progel in Martius's Flora Brasiliensis,[2] where twenty-one species are keyed and described, and six figured. Gilg, in Engler and Prantl's Natürlichen Pflanzenfamilien,[3] divides the genus into five sections or subgenera, under which he enumerates most of the species, seven of which are figured.

Of the eight species here listed from Panama, six are described as new. The large number of new forms is not remarkable, since the material studied comes from a more northern region than any in which a considerable number of species have been collected. One species, described from Panama by Griesbach, is known to the writer only from description, while two Panamanian specimens seem to belong to a species described by Karsten from Venezuela.

KEY TO THE SPECIES.

Calyx limb wanting. Corolla blue, the tube 3 times as long as the lobes; scales one on each stem ..... 7. L. simplex.
Calyx limb present.
  Ovary bearing 2 stipitate glands at the base; corolla blue ..... 8. L. azureus.
  Ovary without glands; corolla not blue.
    Corolla lobes obtuse.
      Filaments many times longer than the anthers; flowers long-pedunculate; corolla tube gradually dilated upward ..... 6. L. pulcherrimus.
      Filaments about as long as the anthers; flowers subsessile; corolla tube cylindric, slightly dilated in the throat ..... 1. L. Truncatus.
    Corolla lobes acute.
      Flowers numerous, in a compact terminal corymb ..... 4. L. albus.
      Flowers solitary, or few and the stems fastigiately branched.
        Anthers appendaged at the base; stems fastigiately branched at the base ..... 5. L. thalesioides.
        Anthers not appendaged; stems usually simple and one-flowered.
          Anthers subsessile; corolla tube twice as long as the calyx or shorter ..... 2. L. stellatus.
          Anthers on long slender filaments; corolla tube 3 times as long as the calyx ..... 3. L. pittieri.

1. Leiphaimos truncatus Standl., sp. nov.

Stems very stout, erect, 3 to 3.5 cm. high, fasciculately branched at the base, the branches simple or again branched, closely covered with scales but these not imbricate; scales opposite, 3 to 5 mm. long, rounded or acutish at the apex, connate for half or two-thirds their length, the sinus between the two bracts very broad, the bracts ascending; pedicels very short, 4 mm. long or less, 1.5 mm. thick; calyx cylindric-campanulate, 6 mm. long, 3.5 mm. in diameter, the 5 teeth broadly ovate, obtuse, minutely ciliolate, scarcely 1 mm. long; corolla apparently pale yellow, the tube cylindric, 3 cm. long, 2.5 mm.

[1] Tijdschr. Nat. Gesch. 7: 129–139. *pls. 1, 2.* 1840.
[2] 6[1]: 219–226. *pl. 60, figs. 3–5, pl. 61, figs. 1–3.* 1865.
[3] 4[3]: 104–105. *fig. 46. A–M, S–Y.* 1895.

in diameter, slightly dilated above but somewhat contracted at the mouth; corolla lobes 5, spreading or ascending, oblong, obtuse, 7 mm. long; filaments stout, about 1 mm. long, inserted 3 mm. below the mouth of the corolla; anthers almost rotund in outline, deeply bilobate, exappendiculate; style slender, 2.2 cm. long; stigma capitate, 1.5 mm. broad, obscurely papillose on the upper surface, smooth beneath; ovary sessile, oblong in outline, rounded at the base, truncate at the apex; ovules ovoid, not appendaged.

Type in the U. S. National Herbarium, no. 888489, collected on the high hills back of Puerto Obaldía, San Blas Coast, Panama, altitude 50 to 200 meters, August, 1911, by H. Pittier (no. 4306a).

Of the subgenus *Euleiphaimos* Gilg and related to *L. spathaceus* and *L. calycinus*. Both these species have blue or lilac corollas with acute lobes and more foliaceous, less completely connate cauline bracts. *Leiphaimos truncatus* may be distinguished from all other species by the truncate ovary. The type material is fragmentary, but it is sufficient to show all the important characters.

2. Leiphaimos stellatus Standl., sp. nov.

Stems very slender, erect, 1-flowered, succulent, terete, pinkish, glabrous, 4 to 12 cm. high; bracts opposite, 4 or 5 pairs, distant, oblong-linear or lance-oblong, 5 to 8 mm. long, with long-acuminate subulate tips, united for about half their length; peduncles slender, 11 to 23 mm. long; calyx pinkish or nearly colorless, ebracteate, 5 to 12 mm. long, 5-lobate to about the middle, the tube cylindric-campanulate, 1 to 2 mm. in diameter, the lobes linear-lanceolate, long-acuminate, with subulate tips; corolla bright orange-yellow, the tube slender, cylindric, 12 to 17 mm. long, slightly dilated in the throat, the lobes narrowly lanceolate to narrowly elliptic, 8 to 14 mm. long, 1.5 to 3 mm. wide, acuminate, rather conspicuously parallel-nerved, especially in old specimens, puberulent on the upper surface near the base, the pubescence extending to the throat of the tube; anthers subsessile, oblong, distinct, not appendaged; style slender, 6 to 8 mm. long, glabrous; stigma capitate, minutely tuberculate on the upper surface; ovary oblong, abruptly acute or acuminate, sessile; ovules ovoid.

Type in the U. S. National Herbarium, no. 679407, collected in forests around Puerto Obaldía, San Blas Coast, Panama, altitude 50 meters or less, August, 1911, by H. Pittier (no. 4294).

This belongs to Gilg's subgenus *Euleiphaimos*, and is closely related to *L. tenuiflorus* (Griseb.) Miquel. That species, however, has a short calyx, only one-fourth as long as the corolla tube, and subulate cauline scales.

3. Leiphaimos pittieri Standl., sp. nov.

Stems very slender, 5 to 12 cm. high, erect, terete, glabrous, purplish, simple or once dichotomous above, the branches when present strictly erect; cauline bracts 4 or 5 pairs, distant, lanceolate or linear-lanceolate, acuminate to a subulate tip, 5 mm. long, erect or appressed, purplish, free nearly to the base; peduncles slender, 6 to 14 mm. long; calyx purple, ebracteate, cleft about halfway to the base, 5 mm. long, 1.5 mm. in diameter, the tube narrowly campanulate, the lobes lanceolate or lance-linear, long-acuminate to a subulate tip; corolla lilac or pale blue, the tube very slender, 14 to 16 mm. long, slightly dilated in the throat and there 3 to 4 mm. wide; corolla lobes narrowly oblong or oblong-lanceolate, acuminate or abruptly acuminate, 5 to 6 mm. long; anthers narrowly oblong, 1 mm. long, not appendaged, on very slender, slightly puberulent filaments, these inserted about one-third the distance above the base of the tube; style slender, 12 mm. long, puberulent; stigma capitate, slightly tuberculate on the upper surface; ovary oblong or lance-oblong in outline, 2.5 mm. long, obtuse, sessile; ovules ovoid, not appendaged.

Type in the U. S. National Herbarium, no. 679405, collected in the forests around Puerto Obaldía, San Blas Coast, Panama, altitude 50 meters or less, August, 1911, by H. Pittier (no. 4292).

Of the subgenus *Euleiphaimos*, but not closely related to any of the described species. The blue corolla and long filaments enable one to distinguish it readily.

4. **Leiphaimos albus** Standl., sp. nov.

Whole plant white; stems slender, erect, sometimes decumbent at the base, 6 to 14 cm. high, succulent, terete, glabrous, simple up to the inflorescence, or rarely with a short erect branch; cauline scales 4 or 5 pairs, 2 to 4 mm. long, distinct almost to the base, lanceolate, long-acuminate; inflorescence a several or many-flowered terminal flat-topped corymb, 1.2 to 3 cm. broad, 1.5 to 3 cm. high, the flowers all sessile or the terminal one short-pediceled; bracts usually present at the base of each branch and commonly 2 at the base of the calyx, small, thin, lanceolate, acuminate; calyx 3 to 4 mm. long, cleft halfway to the base, the tube campanulate, the lobes linear-subulate, the sinuses obtuse; corolla tube slender, cylindric, dilated in the throat, 10 mm. long, about 1 mm. thick; corolla lobes 5, ascending or spreading, trianguar-lanceolate, 2 to 2.5 mm. long, acute or acuminate; anthers subsessile, oblong, 1.25 mm. long, deeply bilobate, each lobe prolonged at the base into a short subulate appendage; style slender, 3 mm. long; stigma capitate, 0.75 mm. in diameter, yellowish, tuberculate on the upper surface; ovary 6 mm. long, linear-lanceolate in outline, gradually tapering upward.

Type in the U. S. National Herbarium, no. 679408, collected in forests around Puerto Obaldía, San Blas Coast, Panama, altitude 50 meters or less, August, 1911, by H. Pittier (no. 4295).

ADDITIONAL SPECIMEN EXAMINED:

PANAMA: In forests, Loma de la Gloria, near Fató (Nombre de Dios), Province of Colón, alt. 10 to 100 meters, August, 1911, *Pittier* 4094.

This is undoubtedly a member of the subgenus *Leianthostemon*. That group has been described as having long filaments, but the discovery of this plant necessitates a modification of its characterization in this respect. *Leiphaimos albus* is related to *L. corymbosus* (Splitg.) Gilg, a species with a lilac corolla and long anthers.

5. **Leiphaimos thalesioides** Standl., sp. nov.

Stems fastigiately branched at the base, the branches simple up to the inflorescence or with one or two erect branches, purplish yellow, terete, succulent, glabrous; cauline scales usually 3 pairs, distant, thin, distinct nearly to the base or sometimes united for half their length, lanceolate or lance-ovate, acuminate to a subulate apex, glabrous; inflorescence a congested terminal corymb, composed of about 6 flowers, or the corymb sometimes fastigiately branched; pedicels stout, 2 to 4 mm. long, subtended at the base by bracts similar to those of the stems; calyx 5 mm. long, ebracteate, cleft halfway to the base, the tube campanulate, 2 to 2.5 mm. in diameter, the lobes linear-lanceolate, long-acuminate, glabrous; corolla yellow, the tube 13 to 16 mm. long, slender-cylindric, 1 to 1.5 mm. in diameter, dilated in the throat; corolla lobes 4 mm. long, oblong, acute or abruptly acute, more or less puberulent; anthers subsessile, oblong, appendaged at the base; style 6 mm. long, rather stout, glabrous; stigma capitate, 1 mm. in diameter, coarsely tuberculate on the upper surface; capsule narrowly oblong, sessile, acute, 5 to 7 mm. long.

Type in the U. S. National Herbarium, no. 679499, collected on the hills of Sperdi, near Puerto Obaldía, San Blas Coast, Panama, altitude 20 to 200 meters, September, 1911, by H. Pittier (no. 4351).

This, like *L. albus*, is a somewhat anomalous representative of the subgenus *Leianthostemon*, differing from the described species of that group in its subsessile anthers. It is not very closely related to any of them in its other characters.

6. Leiphaimos pulcherrimus Standl., sp. nov.

Stems slender, simple below, spafsely fastigiate-branched above, erect, 8 to 13 cm. high, the branches erect, terete, purplish; scales of the stem opposite, the pairs 8 to 17 mm. apart, rather thick, broadly oblong or oblong-oval, rounded or obtuse at the apex and ciliolate, united for about half their length; peduncles slender, 13 to 22 mm. long; calyx ebracteate, purplish, narrowly campanulate, 5 to 6 mm. long, 2.5 to 3 mm. in diameter, the 5 teeth broadly ovate or semi-orbicular, rounded at the apex, ciliolate, about 1 mm. long; corolla bright yellow, the tube 2.1 to 2.6 cm. long, gradually dilated from above the base to the mouth, about 2 mm. in diameter at the base and 5 to 7 mm. at the mouth, minutely papillose within, the lobes 5, oval or oval-oblong, rounded at the apex and minutely puberulent, about 9 mm. long and 5 to 6 mm. wide, spreading, papillose at the base; filaments slender, inserted about 1 cm. above the base of the corolla, about 15 mm. long, minutely retrorse-pilose; anthers narrowly oblong, 2 mm. long, with short slender appendages at the base, coherent; pollen grains ovoid; style slender, 16 mm. long, glabrous; stigma capitate, short-conic, 1.5 mm. broad, nearly smooth on the upper surface; ovary sessile, narrowly oblong, 6 to 7 mm. long, obtuse at the apex.

Type in the U. S. National Herbarium, no. 679430, collected on the high hills back of Puerto Obaldía, San Blas Coast, Panama, altitude 50 to 200 meters, August, 1911, by H. Pittier (no. 4306).

This doubtless belongs to the subgenus *Leianthostemon*, of which four species are known. It has little to do with any of the described species of this group, however, differing from all of them in its fastigiately branched stems, obtuse calyx lobes, long filaments, and large flowers of peculiar form. It has larger flowers, probably, than any other species of the genus.

7. Leiphaimos simplex (Griseb.) Standl.

Voyria simplex Griseb. in Seem. Bot. Voy. Herald 170. 1854.

TYPE LOCALITY: Woods near Ancón Hill, Panama; type collected by Seemann (no. 665).

Stem simple, slender, one-flowered, with a solitary abbreviated scale inserted at the middle; bracts and calyx limb none; corolla salverform, its cylindric-campanulate tube twice longer than the oblong obtuse blue lobes; ovary short-stipitate.

This species is not represented in the recent collections. According to Hemsley[1] it was collected also by Hayes (no. 236) in damp woods near Empire Station. The species is said by Grisebach to be closely related to *Voyria nuda*, a plant described by Splitgerber from Surinam.[2] The latter belongs to the subgenus *Disadena*, but Grisebach does not indicate that the ovary of *Voyria simplex* is glanduliferous, so perhaps it may not belong to this group.

8. Leiphaimos azureus (Karst.) Gilg in Engl. & Prantl, Pflanzenfam. 4[2]: 105. 1895.

Biglandularia azurea Karst. Linnaea 28: 417. 1856.

TYPE LOCALITY: "Crescit locis humidis umbrosis, altitudine 1,000 metr. radicibus Galactodendri adhaerens ad pedem septentrionalem montis 'Cumbre de Valenzia' prope Puerto Cabello," Venezuela.

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[1] Biol. Centr. Amer. Bot. 2: 344. 1882.

[2] Tijschr. Nat. Geschied. Phys. 7: *pl. 1, fig. 2.* 1840.

RANGE: In damp or wet woods, Panama to Venezuela.

ILLUSTRATION: Engl. & Prantl, Pflanzenfam. 4³: *fig. 46, L, M.*

SPECIMENS EXAMINED:

PANAMA: Loma de la Gloria, near Fató (Nombre de Dios), Province of Colón, near sea level, *Pittier* 4081. Forests around Puerto Obaldía, San Blas Coast, near sea level, *Pittier* 4293.

This species is distinguished from all others so far found in Panama by the presence of two small but conspicuous stipitate glands at the base of the ovary. It is upon this character that Karsten based his generic name *Biglandularia*. It is very probable that when more complete material of the various members of the genus has been secured, it will be found that *Disadena*, which antedates *Biglandularia*, is a valid genus. Four species of this section are known, but they do not form a homogeneous group. One of them has no calyx, while of the other three two have appendaged anthers and one has unappendaged ones.

Leiphaimos azureus is a slender plant with few or numerous slender, very succulent stems, each of which is furnished with two or several pairs of thin bracts. The roots often form a dense mass, and are fleshy and knotted. The flowers are small, the corolla limb being about 1 cm. broad, resembling those of some species of *Primula*. The resemblance of the corolla to those of some of the primroses led Baker to apply the name *primuloides* to one of the African species.[1]

A NOTE CONCERNING THE GENUS RANDIA, WITH DESCRIPTIONS OF NEW SPECIES.

The genus *Randia* is one of the larger groups of the family Rubiaceae and is represented in North America by about 40 species. Other members of the genus occur in South America, and a still larger number in the tropics of the Old World. The group is not a particularly well-marked one, being very closely related to *Gardenia*. Indeed, most of the genera of the tribe Gardenieae are seperated by rather artificial characters.

In 1873 Hooker[2] removed from *Randia* a group of American species, associating them in a new genus which he named *Basanacantha*. *Randia* was limited to the species with perfect flowers, the flowers of *Basanacantha* being dioecious. The latter group was characterized also by certain habital peculiarities, none of them of very great importance. As the genus *Basanacantha* was originally delimited it included a homogeneous group of species, but Urban later added two West Indian plants of very different habital characters, plants which in general appearance are very like the common species of *Randia* proper. After study of all the North American species it seems to the writer that the two genera are separated by too artificial a character, and that they should be united. The species of *Basanacantha* listed below are, therefore, transferred to the genus *Randia*. For the other North American species of the group the proper combinations have already been made.

[1] Kew Bull. 1894: 26. 1894. [2] In Benth. & Hook. Gen. Pl. 2: 82.

Randia cinerea (Fernald) Standl.
Genipa (?) cinerea Fernald, Proc. Amer. Acad. **33**: 93. 1897.

Randia lasiantha Standl.
Basanacantha lasiantha Standl. Contr. U. S. Nat. Herb. **18**: 134. 1916.

Randia pittieri Standl.
Basanacantha pittieri Standl. Contr. U. S. Nat. Herb. **18**: 134. 1916.

Randia portoricensis (Urban) Standl.
Basanacantha portoricensis Urban, Symb. Antill. **5**: 507. 1908.

Randia spinifex (Roem. & Schult.) Standl.
Ehretia spinifex Roem. & Schult. Syst. Veg. **4**: 806. 1819.
Gardenia sagraeana A. Rich. in Sagra, Hist. Cuba **11**: 10. 1850.

Randia subcordata Standl.
Basanacantha subcordata Standl. Contr. U. S. Nat. Herb. **18**: 133. 1916.

Randia calycosa Standl., sp. nov.

Unarmed tree, 3 to 10 meters high, the branches grayish, the branchlets stout, densely leafy; stipules 2 to 3 mm. long, rounded-ovate, mucronate, brown, glabrous; petioles 2 to 5 mm. long, glabrous; leaf blades obovate, elliptic-ovate, or oblong-elliptic, 3.5 to 6.5 cm. long, 1.5 to 2.8 cm. wide, attenuate or acuminate at the base, acute or acutish at the apex, chartaceous, glabrous above, lustrous, the venation prominulous, slightly paler beneath, sparsely pilose along the costa with long whitish appressed hairs or glabrate, the lateral veins inconspicuous, usually 4 on each side, the margin plane or subrevolute; flowers perfect (?), terminal, solitary, sessile, 5-parted; calyx tube and limb 1.4 cm. long, densely sericeous-strigose, the lobes foliaceous, rhombic-orbicular, subapiculate, 6 to 9 mm. long and broad, sparsely strigose outside, glabrous within; corolla salverform, the tube 2.7 to 3.2 cm. long, sericeous-strigose outside, the lobes lance-oblong, 1.7 to 2.5 cm. long, acute, glabrate outside, glabrous within, the throat naked; anthers included; fruit oval-globose, 3 to 3.8 cm. long, 2 to 2.5 cm. thick, smooth or obscurely costate, sparsely strigillose or glabrate, the pericarp very thick and hard; seeds numerous, rhombic-orbicular, 8 to 9 mm. long.

Type in the U. S. National Herbarium, no. 677593, collected in humid forest around Los Siguas Camp, southern slope of Cerro de la Horqueta, Chiriquí, Panama, altitude about 1,700 meters, March, 1911, by H. Pittier (no. 3198).

A very distinct species, not closely related to any other described from North America. The broad, foliaceous calyx lobes are the most noteworthy character.

Randia laevigata Standl., sp. nov.

Unarmed shrub, about 2 meters high, the branchlets brownish, rimose, glabrous or sparsely puberulent when young, the internodes often elongate; stipules connate at the base, triangular-ovate, about 1 cm. long, acute, cuspidate-mucronate, thick, glabrous or puberulent outside, glabrous within; leaves sessile or short-petiolate, the blades obovate-oblong or rhombic-ovate, 14 to 23 cm. long, 5 to 8.5 cm. wide, acuminate or long-attenuate at the base, acute or acuminate at the apex, chartaceous or membranaceous, bright green and lustrous above, puberulent when young, glabrate in age, the venation plane or impressed, paler beneath, densely and minutely pilose when young, glabrate in age except along the veins, the lateral veins prominent, 10 to 13 on each side, nearly straight, ascending at an angle of 45° or more; calyx glabrous, the tube prolonged beyond the ovary, the 5 lobes triangular-subulate, 2 to 3 mm. long; fruit subglobose, about 6.5 cm. long, umbonate, glabrous, borne on a terminal peduncle about 3.5 cm. long; seeds oval or suborbicular, 8 to 10 mm. long, yellowish brown.

Type in the U. S. National Herbarium, no. 635870, collected in the Sierra de Álamos, Sonora, Mexico, March 18, 1910, by J. N. Rose, P. C. Standley, and P. G.

Russell (no. 13051). Specimens from Acaponeta, Tepic, collected in 1897 by J. N. Rose (nos. 1488 and 3166) apparently belong here also.

Randia laevigata appears to be related to *R. formosa* (Jacq.) K. Schum., but the latter is well distinguished by its small leaves, sericeous-strigose ovary, and small fruit.

Randia pleiomeris Standl., sp. nov.

Branches slender, brownish, strigose when young, with mostly elongate internodes, bearing few pairs of stout ascending spines 1 to 1.5 cm. long, the leaves crowded on very short lateral spurs; stipules ovate-deltoid, about 2 mm. long, strigose or glabrous outside, pilose within at the base; petioles slender, 4 to 8 mm. long, glabrous or sparsely puberulent; leaf blades cuneate-orbicular or broadly obovate, 0.8 to 1.8 cm. long, 0.7 to 1.3 cm. wide, cuneate or abruptly decurrent at the base, rounded or truncate at the apex, membranaceous, glabrous above, sparsely appressed-pilose beneath along the costa, the lateral veins obscure; flowers terminal, solitary, sessile; calyx tube appressed-pilose, 2.5 mm. long, the limb glabrous, 2 mm. long, the lobes usually 7, linear, about 4 mm. long, sparsely ciliate; corolla salverform, glabrous outside, the tube slender, 2.5 cm. long, the 5 lobes ovate or ovate-oblong, about 1 cm. long, acuminate, glabrous within, the throat naked; anthers subexserted.

Type in the U. S. National Herbarium, no. 888490, collected at Santa Rosa, Guatemala, altitude 900 meters, May, 1892, by Heyde and Lux (J. D. Smith, no. 3166, in part).

The type collection was distributed as "*Randia Xalapensis*, Mart. et Gal.," with the note, "Flores steriles pollicares et ultra, fertiles vix 4-lineares." It is evident, however, that two distinct plants, not closely related, have been confused. *Randia pleiomeris* is the plant with large flowers. It appears to be related to *R. longiloba* Hemsl., of Yucatán, but in the latter the tube of the corolla is only as long as the lobes and the leaves are glabrous beneath.

Randia guatemalensis Standl., sp. nov.

Branches reddish brown, the branchlets stout, subdivaricate, densely puberulent when young, bearing at the apex 2 stout spines 4 to 8 mm. long, the leaves fasciculate in the axils; stipules ovate-deltoid, 1 to 1.5 mm. long, mucronate, strigillose outside; petioles 1 to 11 mm. long, scaberulous or glabrate; leaf blades mostly oblong-elliptic, sometimes elliptic, broadly obovate, broadly ovate, or suborbicular, 0.6 to 5.5 cm. long, 0.6 to 2.8 cm. wide, rounded to attenuate at the base, usually obtuse or acutish at the apex, often mucronulate, subcoriaceous, lustrous above, the costa prominent, puberulent along the costa, paler beneath, minutely pilose along the costa, the lateral veins obscure, 5 to 8 on each side, the margin plane; flowers perfect, 5-parted, axillary, solitary, sessile; calyx 1.5 mm. long, scaberulous, the lobes minute, triangular-subulate, less than half as long as the limb; corolla 4 to 5 mm. long, glabrous outside, acuminate in bud, the tube cylindric, the throat densely white-barbate, the lobes broadly ovate, apiculate, shorter than the tube; anthers subexserted.

Type in the U. S. National Herbarium, no. 472930, collected near Secanquím, Alta Verapaz, Guatemala, altitude 550 meters, May, 1905, by H. Pittier (no. 271).

Related to *Randia erythrocarpa* Krug & Urban, of Haiti, and *R. mitis* L. (*R. aculeata* L.), a widely distributed species of tropical America. The former differs in its large corolla, and the latter in its long corolla lobes.

Randia malacocarpa Standl., sp. nov.

Shrub, about 1 meter high, the branches dark reddish brown or grayish, the branchlets divaricate, stout, short-pilose when young, bearing at the apex 2 stout spines 0.6 to 1.5 cm. long, the leaves mostly crowded on very short

lateral spurs; stipules ovate, acuminate, 1 to 2 mm. long, thick, brownish, glabrous or short-pilose outside, glabrous within; petioles stout, 3 mm. long or shorter, short-pilose; leaf blades mostly ovate, ovate-oblong, or narrowly elliptic-oblong, rarely rounded-obovate, 2.5 to 5.5 cm. long, 0.8 to 2.5 cm. wide, acute to long-attenuate at the base, or rounded or obtuse and short-decurrent, usually acute at the apex, sometimes obtuse or rounded, often subapiculate, membranaceous or chartaceous, puberulent or scaberulous above, densely short-pilose beneath, the lateral veins inconspicuous, 3 to 5 on each side; flowers perfect, terminal, sessile, solitary or clustered; calyx densely short-pilose, the tube about 2 mm. long, the 5 lobes linear or oblong, 1 to 1.5 mm. long, acute or obtuse, spreading; corolla salverform, sparsely hirtellous outside, the tube 3 to 4 mm. long, ampliate above, the 5 lobes rounded, 2 to 3 mm. long, glabrous within, the throat naked; anthers subexserted; fruit globose, 1.2 cm. in diameter (or larger?), smooth, densely velvety-pilose, the pericarp very thick and hard; seeds numerous.

Type in the U. S. National Herbarium, no. 302274, collected near Acaponeta, Tepic, Mexico, July 30, 1897, by J. N. Rose (no. 3298).

The following additional specimens belong here:

SINALOA: Mazatlán, in thickets, April, 1910, *Rose, Standley & Russell* 13833. Rosario, April, 1910, *Rose, Standley & Russell* 14526.

TEPIC: Acaponeta, July, 1897, *Rose* 1514; April, 1910, *Rose, Standley & Russell* 14454.

Allied to *R. xalapensis* Mart. & Gal., but easily recognized by the copious spreading pubescence of the fruit.

Randia rosei Standl., sp. nov.

Branches brownish, with short internodes, short-pilose when young with appressed hairs, armed with numerous pairs of stout divergent spines 1 to 2 cm. long, the leaves mostly crowded on very short lateral spurs; stipules about 2 mm. long, rounded-ovate, obtuse, mucronate, thick, brownish, glabrous; petioles slender, 1 to 5 mm. long, ciliate; leaf blades suborbicular, rhombic-oval, or rhombic-ovate, 1 to 2.5 cm. long, 0.7 to 1.8 wide, rounded or obtuse at the base and short-decurrent, rounded or very obtuse at the apex, sometimes apiculate, herbaceous, bright green, ciliate, short-pilose beneath along the veins, elsewhere glabrous, the lateral veins inconspicuous, 5 or 6 on each side, ascending or subdivaricate; flowers perfect, terminal, solitary, sessile; calyx tube about 2 mm. long, pilose, the 5 lobes linear, 3 to 6 mm. long, ciliate; corolla salverform, glabrous outside, the tube 10 to 12 mm. long, ampliate above, the throat naked, the 5 lobes ovate-oval, 8 mm. long, 5 to 7 mm. wide, obtuse or acutish, apiculate, glabrous within; anthers 1.5 to 2 mm. long, included; fruit (very immature) subglobose, rather sparsely pilose.

Type in the U. S. National Herbarium, no. 300395, collected at Rosario, Sinaloa, Mexico, July 7, 1897, by J. N. Rose (no. 1551).

Near *R. canescens* Greenm., a species with densely pilose leaves and pilose corolla.

NINE NEW SPECIES OF HOFFMANNIA FROM MEXICO AND CENTRAL AMERICA.

Hoffmannia obtains its greatest development in North America. Recent monographic study indicates that at least 33 species occur on this continent, chiefly in Mexico and Central America, only two being natives of the West Indies. They must be of very local distribution,

for it is unusual to find in herbaria more than two or three specimens of any species.

Hoffmannia rotundata Standl., sp. nov.

Branchlets stout, subterete, glabrate, the internodes elongate; leaves opposite, the petioles stout, 1.5 to 3 cm. long, sparsely villosulous or glabrate, the blades broadly oval-elliptic, 10.5 to 16 cm. long, 6 to 7.5 cm. wide, acutish or short-acuminate at the base, very obtuse to acute at the apex and short-acuminate, membranaceous, dark green above, glabrous, paler beneath, ferruginous-villosulous, especially along the veins, the costa very stout, prominent, the lateral veins slender, strongly arcuate, about 12 on each side; cymes dense, sessile, with numerous flowers, these sessile or short-pedicellate; calyx sparsely ferruginous-villous or glabrate, 2 to 2.5 mm. long, the tube turbinate, angulate, the lobes deltoid, acute, shorter than the tube; corolla 6 to 8 mm. long, glabrous or with a few scattered hairs, the lobes lance-oblong, acutish, twice as long as the tube.

Type in the herbarium of the Missouri Botanical Garden, no. 765057, collected on Cerro del Boquerón, Chiapas, Mexico, June, 1914, by C. A. Purpus (no. 7268, in part).

Of the previously described species, *H. tuerckheimii* Donn. Smith, of Guatemala, is most closely related to the present plant. That species, however, has a long-villous corolla, fewer flowers, and subcoriaceous leaves.

Purpus's no. 7268 is evidently a mixture. Specimens of this collection in other herbaria are referred to *Hoffmannia chiapensis*, described below.

Hoffmannia uniflora Standl., sp. nov.

Branches fruticose, slender, brownish, the branchlets very slender, subterete, bifariously rufous-puberulent, the internodes short; stipules deltoid, acutish, about 1 mm. long, deciduous; leaves opposite, the petioles slender, 3 to 6 mm. long, sparsely puberulent, the blades narrowly oblong-elliptic or lance-elliptic, 4 to 8 cm. long, 1 to 2 cm. wide, attentuate to the base, acuminate or long-acuminate at the apex, membranaceous, deep green above, glabrous, paler beneath, sparsely puberulent along the veins or glabrate, the lateral veins very slender, about 6 on each side, arcuate-divaricate or ascending; flowers mostly solitary, sometimes in 2-flowered cymes, the pedicels slender, 3 to 6 mm. long, glabrate; calyx lobes linear, acute, in fruit 2 to 3 mm. long; fruit oval, 6 to 7 mm. long, 5 to 6 mm. wide, costate, glabrous; seeds minute, brownish, coarsely reticulate.

Type in the U. S. National Herbarium, no. 941382, collected near Cobán, Alta Verapaz, Guatemala, altitude 1,100 meters, February, 1908, by H. von Türckheim (no. II. 2107).

Related to *H. mexicana* (Link, Klotzsch & Otto) Hemsl., but in that the calyx lobes are minute and broadly deltoid.

Hoffmannia panamensis Standl., sp. nov.

Shrub or small tree, 2 to 4 meters high, glabrous throughout, the branches slender, subterete, the internodes elongate; leaves opposite, the petioles slender, 1 to 3.5 cm. long, the blades oblong, elliptic-oblong, or lance-oblong, 7 to 15.5 cm. long, 2.5 to 5.5 cm. wide, acute or very obtuse at the base, long-acuminate or cuspidate-acuminate at the apex, membranaceous, bright green above, pale yellowish green beneath, the lateral veins prominent, about 11 on each side; cymes sessile, few or many-flowered, dense, the flowers 4-parted, short-pedicellate or subsessile; calyx 2.5 mm. long, the lobes triangular or lance-triangular, acute, minute at anthesis, sometimes elongate in fruit; corolla yellow, 7 to 8 mm. long, the lobes lance-oblong, acutish, twice as long as the tube or longer; ovary 2-celled.

Type in the U. S. National Herbarium, no. 677443, collected in forests along the Río Ladrillo, above El Boquete, Chiriquí, Panama, altitude 1,200 to 1,300 meters, March, 1911, by H. Pittier (no. 3056).

Hoffmannia calycosa Donn. Smith, of Guatemala, is a near relative, but is distinguished by the long, linear calyx lobes.

Hoffmannia tonduzii Standl., sp .nov.

Shrub, the branchlets slender, subterete, glabrous, the internodes elongate; stipules minute; leaves opposite, the petioles stout, 2 to 6 mm. long, glabrous, the blades oval-elliptic or broadly obovate-elliptic, 6.5 to 12 cm. long, 3.5 to 5.5 cm. wide, acute or cuneate at the base, acuminate or cuspidate-acuminate at the apex, with an obtuse acumen, membranaceous, glabrous, dark green above, paler beneath, the lateral veins slender, about 8 on each side, subarcuate; cymes few-flowered, sessile or subsessile, the pedicels in fruit up to 5 mm. long, some of the flowers usually sessile; calyx glabrous or sparsely puberulent, the tube turbinate, angulate, 2.5 mm. long, the lobes narrowly triangular, 1 to 1.5 mm. long, acute; corolla 6 to 7 mm. long (perhaps longer), glabrous outside, the lobes lance-oblong, acute, twice as long as the tube.

Type in the U. S. National Herbarium, no. 941386, collected in forests of Las Vueltas, Tucurrique, Costa Rica, altitude 635 to 700 meters, May, 1899, by A. Tonduz (no. 13373).

Distinguished from *H. panamensis*, described above, by the few-flowered inflorescences, elongate pedicels, turbinate calyx tube, and proportionately broader leaf blades.

Hoffmannia orizabensis Standl., sp. nov.

Low shrub, the branches slender, decumbent, rufous-villosulous when young; leaves opposite, the petioles slender, 0.5 to 2 cm. long, rufous-villosulous or puberulent, the blades elliptic or elliptic-oblong, 3 to 8 cm. long, 1 to 3 cm. wide, acute at the base, acute or subacuminate at the apex, membranaceous, deep green on the upper surface, rufous-villosulous along the costa, conspicuously white-striolate, paler beneath, rufous-villosulous along the veins, the costa slender, prominent, the lateral veins slender, prominulous, 7 to 9 on each side, ascending, strongly arcuate; inflorescence 4-flowered, the peduncles slender, about 1 cm. long, rufous-villosulous, the pedicels slender, 2 to 3 mm. long; calyx sparsely villosulous, the tube oblong-turbinate, 2.5 mm. long, the lobes narrowly triangular, acute; corolla 12 to 13 mm. long, sparsely villosulous outside, the throat ampliate, the lobes ovate-oval, obtuse or rounded, half as long as the tube; anthers obtuse.

Type in the Gray Herbarium, collected in the region of Orizaba, Veracruz or Puebla, Mexico, in 1855, by Mueller (no. 1359).

Hoffmannia affinis Hemsl., of Costa Rica, known to the writer only from the original description, must be closely related to the present plant, but it is described as having a corolla only 6 to 8 mm. long, with lobes slightly longer than the tube.

Hoffmannia decurrens Standl., sp. nov.

Shrub, the branches grayish, the branchlets stout, subangulate, rufous-villosulous or glabrate, the internodes mostly elongate; stipules deltoid, minute; leaves opposite, the petioles stout, 0.5 to 3 cm. long, villosulous or glabrate, the blades oblong-oblanceolate or narrowly elliptic, 7.5 to 16.5 cm. long, 1.8 to 4.5 cm. wide, long-attenuate to the base, acute or short-acuminate at the apex, membranaceous, dark green above, glabrous, paler beneath, villosulous along the veins or finally glabrate, the lateral veins slender, arcuate-ascending, 8 to 10 on each side; cymes usually many-flowered, sessile or short-pedunculate,

the branches rufous-villosulous, the flowers subsessile or the pedicels sometimes 5 mm. long, the bracts minute; calyx rufous-villous or villosulous, the tube obovoid, 2.5 to 3 mm. long, the lobes triangular or narrowly triangular, 1 to 1.5 mm. long, obtuse; corolla 8 to 9 mm. long, white, tinged with rose, sparsely villous or villosulous, the lobes oblong, obtuse, slightly shorter than the tube; fruit oval, about 6 mm. long, villosulous; seeds about 1 mm. long, brown, dull, coarsely reticulate.

Type in the U. S. National Herbarium, no. 392077, collected in forests of Santa Rosa Copey, Costa Rica, altitude 1,800 to 2,000 meters, April, 1898, by A. Tonduz (no. 12230). Tonduz's numbers 11671 and 11909, from the same locality, collected in February, 1898, represent the same species.

Hoffmannia cuneatissima Robinson, described from Morelos, Mexico, is a similar plant, but in it the calyx lobes are minute and the lobes of the corolla longer than the corolla tube.

Hoffmannia confertiflora Standl., sp. nov.

Branches slender, obtusely quadrangular, glabrous, the internodes elongate; stipules caducous; leaves opposite, the petioles 5 to 10 mm. long, glabrate, the blades elliptic or oblong-elliptic, 6 to 11.5 cm. long, 2.5 to 4 cm. wide, acuminate or long-attenuate at the base, acuminate at the apex, membranaceous, deep green above, copiously ferrugino-villous, paler beneath, villosulous along the veins, the lateral veins prominent, about 11 on each side, arcuate-divaricate; cymes sessile, few-flowered, dense, the flowers sessile or short-pedicellate, 4-parted; calyx 2 to 2.5 mm. long, glabrous, the lobes minute, broadly deltoid; corolla 9 mm. long, glabrous, the lobes lance-oblong, acute, equaling the tube; anthers 3 mm. long.

Type in the U. S. National Herbarium, no. 888491, collected at San Miguel Uspantán, Quiché, Guatemala, altitude 2,100 meters, April, 1892, by Heyde and Lux (J. D. Smith, no. 3169).

Readily distinguished from related species by the villosulous upper surface of the leaves.

Hoffmannia angustifolia Standl., sp. nov.

Suffrutescent, glabrous throughout, the branches stout, subterete, the internodes short; leaves opposite, the petioles 1 to 2.5 cm. long, the blades very narrowly elliptic, 10.5 to 20 cm. long, 3.5 to 5 cm. wide, long-attenuate at the base, long-attenuate or subacuminate to the obtuse apex, subchartaceous, bright green above, slightly paler beneath, the lateral veins prominent, 12 to 14 on each side, arcuate-ascending at an obtuse angle; cymes sessile, few or many-flowered, dense, shorter than the petioles, the flowers sessile or nearly so, 4-parted; calyx tube 2 mm. long, the lobes lance-oblong, 1 to 1.5 mm. long, obtuse, minutely ciliolate; corolla 12 mm. long, glabrous, the lobes linear-oblong, obtuse, ascending, equaling or slightly shorter than the tube; anthers 3 mm. long.

Type in the U. S. National Herbarium, no. 888492, collected at Acatepeque, Department of Zacatepequez, Guatemala, altitude 1,290 meters, March, 1892, by John Donnell Smith (no. 2747).

Hoffmannia psychotriaefolia (Benth.) Griseb., of Costa Rica, is closely related, but is separated by its minute, deltoid calyx lobes and broad, cuspidate-attenuate leaf blades.

Hoffmannia chiapensis Standl., sp. nov.

Branches stout, obtusely quadrangular, glabrous, the internodes mostly elongate; stipules small deltoid; leaves opposite, the petioles slender, 1.7 to 6 cm. long, glabrous, the blades elliptic or elliptic-oblong, 10 to 19 cm. long, 4 to 7.5 cm. wide, acuminate or attenuate at the base, acuminate at the apex, often falcate-acuminate, membranaceous, bright green above, glabrous, pale beneath, sparsely

villosulous along the costa or glabrate, the lateral veins prominent, about 14 on each side, arcuately subdivaricate; cymes sessile or short-pedunculate, few or many-flowered, about 2 cm. long, the flowers 4-parted, the pedicels slender, 1 to 6 mm. long; calyx tube oblong, glabrous, 2 mm. long, the lobes lance-triangular or oblong, obtuse, 1 to 2.5 mm. long, sparsely puberulent; corolla 10 to 12 mm. long, yellow, glabrous, the lobes narrowly oblong, obtuse, about equaling the tube; anthers 3 mm. long, yellow; fruit oblong, 5 mm. long or larger.

Type in the U. S. National Herbarium, no. 567526, collected on Cerro del Boquerón, Chiapas, Mexico, June, 1914, by C. A. Purpus (no. 7268, in part). Specimens of the same collection in the Gray Herbarium and the herbarium of the New York Botanical Garden also belong here.

Hoffmannia conzattii Robinson and *H. strigillosa* Hemsl. are both close relatives, but have the leaves glabrous or strigillose beneath and of different outline.

A specimen of Purpus's no. 7268 in the herbarium of the Missouri Botanical Garden is the type of *Hoffmannia rotundata*, described above.

NEW RUBIACEAE OF VARIOUS GENERA FROM NORTH AMERICA.

Of the species of this group discussed here the most interesting is the new *Duroia*, for this genus has been known previously only from South America. It is a characteristic example of the numerous genera added to the known flora of North America by recent explorations in Panama and Costa Rica. The writer has already described species of *Cassupa*[1] and *Stachyarrena*[2] from Panama, two other genera previously believed to be exclusively South American.

Alseis Schott; Spreng. Syst. Veg. 4: Cur. Post. 404. 1827.

A collection made by Dr. G. F. Gaumer at Buena Vista Xbac, Yucatán (no. 1043), is of unusual interest, because it belongs undoubtedly to this genus. The material collected consists of leafless fruiting branches, and so, unfortunately, it is impossible to determine what species is represented. *Alseis* is represented by four known species, three of them natives of Brazil and Venezuela, the other, *A. blackiana* Hemsl., of Colombia and Panama. The Yucatán collection, consequently, represents a large extension of range for the genus. So far as may be judged from the fruit the Yucatán plant may be the same as the Panamanian one. Doctor Gaumer gives the Maya name as "cacaoché."

Hamelia costaricensis Standl., sp. nov.

Branchlets stout, angulate, densely and minutely fulvous-puberulent; stipules small, deltoid; leaves opposite, the petioles slender, 1.2 to 3.5 cm. long, minutely puberulent, the blades oval-ovate or oval-elliptic, 8 to 19 cm. long, 4 to 10.5 cm. wide, rounded and short-decurrent at the base, very acute or subacuminate at the apex, membranaceous, minutely puberulent along the veins, the venation prominent beneath, the lateral veins about nine on each side, subarcuate; inflorescence pedunculate, branched, the branches puberulent, the flowers sessile, secund; calyx densely puberulent, the tube oblong, 3.5 mm. long, the lobes subu-

[1] Contr. U. S. Nat. Herb. 18: 135. 1916.
[2] Contr. U. S. Nat. Herb. 18: 142. 1916.

late, 1 to 1.5 mm. long; corolla densly fulvous-puberulent in bud, becoming glabrate, the tube 2.2 cm. long, ampliate upward, 6 to 7 mm. wide in the throat, the lobes rounded, 5 mm. long, spreading.

Type in the U. S. National Herbarium, no. 764417, collected near San Mateo, Costa Rica, August, 1890, by P. Biolley (no. 2656).

The material available is scanty but sufficient to show the essential characters of the plant. *H. xorullensis* H. B. K. is perhaps the nearest ally, being distinguished by a larger corolla which is copiously pilose or villosulous outside.

Hamelia panamensis Standl., sp. nov.

Tree, 4.5 meters high, with a trunk 10 cm. in diameter, the bark gray, the branchlets grayish, glabrous; leaves apparently opposite, the petioles about 5 cm. long, the blades oval or broadly ovate, 11 to 19 cm. long, 6 to 12 cm. wide, broadly rounded at the base and short-decurrent, acute or short-acuminate at the apex, membranaceous, glabrous, bright green, the lateral veins about 12 on each side, arcuate-divaricate, the margin plane; inflorescence very ample, much branched, 15 cm. wide or larger, pedunculate, the branches slender, elongate, glabrous, the flowers sessile, the bractlets subulate, very small; calyx glabrous, 2.5 to 3.5 mm. long, the lobes deltoid, acute; corolla about 2.5 cm. long, glabrous, the tube gradually ampliate upward, 4.5 mm. thick in the throat, the lobes ovate, about 6 mm. long, spreading; fruit cylindric, 6 to 7 mm. long, 5-celled; seeds brown, foveolate.

Type in the U. S. National Herbarium, no. 678258, collected above Paca, Panama, April 16, 1908, by R. S. Williams (no. 744). Another specimen of the same collection is in the herbarium of the New York Botanical Garden.

A well-marked species, related to *H. ventricosa* Swartz and *H. cuprea* Griseb., natives of Cuba and Jamaica, but differing from them in the very large leaves and spreading corolla lobes.

Casasia jacquinioides (Griseb.) Standl.

Alibertia jacquinioides Griseb. Cat. Pl. Cub. 123. 1866.

Casasia parvifolia Britton, Bull. Torrey Club **43**: 461. 1916.

A very distinct plant, described properly by Britton in the genus *Casasia*. A specimen of the type collection of *Alibertia jacquinioides* in the herbarium of the Missouri Botanical Garden is, however, clearly the same as *Casasia parvifolia*.

Duroia costaricensis Standl., sp. nov.

Branchlets stout, hirsute, densely leafy at the ends; leaves opposite, the petioles stout, 7 mm. long or shorter, densely hirsute, the blades oblong-obovate, 10 to 17.5 cm. long, 3.5 to 6.5 cm. wide, cuneately narrowed to the base, obtuse at the apex and abruptly cuspidate-acuminate, with a narrow falcate acumen, chartaceous, copiously hirsute with slender fulvous hairs, the venation prominent beneath, the lateral veins slender, 7 or 8 on each side, the margin plane; staminate flowers fasciculate-cymose at the ends of the branchlets, short-pedicellate; calyx very densely hirsute with pale brownish hairs, the tube 1.5 mm. long, the limb 4 to 4.5 mm. long, densely whitish-sericeous within, the lobes 6 or 7, distant, linear-subulate, as long as the limb; corolla (in bud) 14 mm. long, densely sericeous outside, the tube stout, glabrous or nearly so within, the 6 lobes lance-oblong, acutish, longer than the tube, finely sericeous within; anthers sessile, 4 mm. long.

Type in the U. S. National Herbarium, no. 938658, collected at Marais de Sierpe, Costa Rica, March, 1892, by H. Pittier (no. 6803).

The genus *Duroia* has not been reported previously from North America. The species are chiefly Brazilian, although some occur in Colombia.

Phialanthus macrostemon Standl., sp. nov.

Branches stout, brownish, roughened by the persistent stipules, the branchlets slightly resinous, minutely papillose-scaberulous; stipule sheath about 2 mm. long; petioles stout, 4 to 5 mm. long, papillose-scaberulous; leaf blades elliptic-oblong or narrowly elliptic, 4 to 5 cm. long, 1.2 to 1.7 cm. wide, broadest at or near the middle, acute or attenuate at the base, narrowed to the rounded apex, rigid-coriaceous, glabrous, the lateral veins obsolete, the costa salient, deep green above, lustrous, brownish beneath. the margin thickened, revolute; inflorescence few-flowered, short-pedunculate, the flowers sessile or nearly so; calyx lobes spatulate, obtuse, at anthesis 1.5 to 2 mm. long, glabrous; corolla, 3.5 mm. long. the lobes ovate-oval, rounded at the apex, less than half as long as the tube; stamens long-exserted, the anthers exceeding the corolla lobes.

Type in the herbarium of the New York Botanical Garden, collected at Pinar de El Purio, Cabonico, Cuba, September 15, 1917, by J. T. Roig (no. 143).

Related to *Phialanthus rigidus* Griseb., a species with narrowly lanceolate leaf blades (3 to 8 mm. wide) and very short petioles. All the species of *Phialanthus* are very closely related, and their validity can not be established until much more material is obtained. The present plant seems to be quite as distinct as the species already described.

Machaonia coulteri (Hook. f.) Standl.

Microsplenium coulteri Hook. f. in Benth. & Hook. Gen. Pl. **2**: 4. 1873.

Machaonia fasciculata A. Gray, Proc. Amer. Acad. **19**: 77. 1883.

The genus *Microsplenium* Hook. f. was referred originally to the family Caprifoliaceae, but. as has been pointed out by other writers, it differs in no essential character from *Machaonia*. Gray's *Machaonia fasciculata* was founded upon one of the two collections upon which Hooker based the genus *Microsplenium*.

Chiococca pubescens Standl., sp nov.

Branches slender, green or grayish, short-pilose when young, the internodes shorter than the leaves; stipules 1.5 to 2 mm. long, subulate-cuspidate from a broad base; petioles 2 to 4 mm. long; leaf blades ovate, oblong-ovate, or oval-ovate, 3 to 6 cm. long, 1.2 to 3.2 cm. wide, rounded or obtuse at the base, short-acuminate or subacuminate at the apex, chartaceous, green above, sparsely short-pilose when young, becoming glabrous, the costa and lateral veins prominulous, paler beneath, densely short-pilose or subtomentose when young, often glabrate in age, the costa slender, prominent, the lateral veins prominulous, the margin plane or subrevolute; racemes few-flowered, short-pedunculate, the pedicels 2 to 4 mm. long, short-pilose, the bracts minute; calyx 2.5 mm. long, densely short-pilose, the lobes deltoid, acute; corolla 5 to 6 mm. long, sparsely villosulous or glabrate, the lobes triangular-oblong, obtuse, nearly as long as the tube; anthers semiexserted; fruit (immature) about 3 mm. long, compressed, short-pilose.

Type in the U. S. National Herbarium, no. 840975, collected in the vicinity of San Luis Tultitlanapa, Puebla, Mexico, July, 1908, by C. A. Purpus (no. 3334). Also collected in the vicinity of Victoria, Tamaulipas, altitude about 320 meters, in 1907, by Edward Palmer (no. 136).

A very distinct plant because of its pubescence, all the others of the genus being glabrous or practically so. The type collection was assigned a new generic name, fortunately unpublished, by Brandegee.

Guettarda deamii Standl., sp. nov.

Tree, 3.5 to 4.5 meters high, the branches blackish, lenticellate, the branchlets stout, densely short-pilose, the internodes short; stipules ovate-oblong,

2.5 to 4 mm. long, obtuse or acutish, appressed-pilose outside, soon deciduous; leaves opposite, the petioles stout, 5 to 9 mm. long, densely short-pilose, the blades mostly oval, sometimes oblong-oval or obovate-oval, 4 to 8.5 cm. long, 2.5 to 4.5 cm. wide, rounded at the base, broadly rounded at the apex, chartaceous, green above, densely short-pilose or pilose-scaberulous, the venation prominulous but more or less embedded, paler beneath, densely velutinous-pilosulous, the costa and lateral veins prominent, the latter 8 to 10 on each side, subarcuate, ascending at an angle of 50° or more, the intermediate veins prominulous, laxly reticulate, the margin recurved; cymes subcapitate, 3 to 5-flowered, the peduncles very stout, 3 to 10 mm. long, densely short-pilose, the flowers sessile, the bractlets subulate, 3 to 4 mm. long, persistent; fruit globose, about 8 mm. in diameter, 3 or 4-celled, minutely tomentulose.

Type in the U. S. National Herbarium, no. 796136, collected on mountain ridges near Gualán, Guatemala, altitude 185 meters, June 15, 1909, by C. C. Deam (no. 6271).

A very distinct plant, of the group of *Guettarda elliptica* Swartz. *Guettarda dichotoma* Mart. & Gal., described from Veracruz, may be a near relative, but it is an imperfectly known species.

Guettarda filipes Standl., sp. nov.

Branches blackish or reddish brown, lenticellate, the branchlets slender, densely pilose, the internodes elongate; stipules triangular-lanceolate, filiform-acuminate, about 5 mm. long, deciduous; leaves opposite, the petioles slender, 3 to 8 mm. long, short-pilose, the blades ovate, elliptic, or oblong-elliptic, 3 to 5.5 cm. long, 1.2 to 2.5 cm. wide, rounded to acutish at the base, short-acuminate at the apex, membranaceous, green above, densely short-pilose, at least when young, the venation plane, paler beneath, densely pilose with short, whitish, mostly spreading hairs, the costa and lateral veins prominulous, the latter about 7 on each side, subarcuate, the intermediate veins mostly obsolete, the margin plane; cymes lax, few-flowered, the peduncles subfiliform, 1.3 to 3.5 cm. long, pilose, the branches short, slender, the flowers partly sessile and partly on slender pedicels 1 to 3 mm. long, the bractlets linear, equaling or much longer than the calyx; calyx appressed-pilose, the limb 1.5 mm. long, shallowly bilobate; corolla minutely sericeous outside, the tube slender, 6 to 7 mm. long, the lobes rounded, 1 to 1.5 mm. long, glabrous within; ovary 2-celled.

Type in the U. S. National Herbarium, no. 302475, collected near Huasemote, Durango, Mexico, August 15, 1897, by J. N. Rose (no. 3498).

Related, although probably not very closely, to *G. deamii*, described above; distinguished by the 2-celled ovary, acuminate leaves, and partly pedicellate flowers.

DESCRIPTIONS OF NEW SPECIES OF SEVERAL FAMILIES, WITH MISCELLANEOUS NOTES.

All the new species described below are Mexican plants. Of greatest interest is the *Coussapoa*, obtained in Oaxaca by Doctor Reko, for not only is the species an unusually distinct one but it adds another genus to the long list of known Mexican trees. Another genus, *Tonduzia*, also may be reported from Mexico as the result of Doctor Reko's explorations. The two new species of *Platanus* described here are noteworthy additions to one of our smallest genera of North American trees.

Brosimum conzattii Standl., sp. nov.

Branches grayish, rimose, glabrous; stipules 8 to 13 mm. long, attenuate, sparsely and minutely puberulent outside; leaves glabrous, the petioles stout, 3 to 8 mm. long, the blades narrowly oblong or lance-oblong, sometimes narrowly elliptic-oblong, 4 to 9.5 cm. long, 1.5 to 3.2 cm. wide, rounded or very obtuse at the base, obtuse or acutish at the apex or obscurely obtuse-acuminate, coriaceous, grayish green above, lustrous, the costa prominent, the lateral veins prominulous, 11 to 15 on each side, subdivaricate, slightly paler beneath, the costa stout, prominent, the lateral veins prominulous, the intermediate veins finely reticulate, impressed, the margin plane; flower heads 4 to 6 mm. in diameter, the peduncles 4 mm. long or shorter, obscurely puberulent; bractlets 0.7 to 1.2 mm. broad, glabrous, minutely ciliolate; fruits oblique, slightly compressed, 1.5 to 1.8 cm. in diameter, dark brown; seed depressed-globose, 1.3 to 1.6 cm. in diameter; radicle obtuse.

Type in the U. S. National Herbarium, no. 763895, collected at Cafetal San Rafael, Distrito de Pochutla, Oaxaca, Mexico, altitude 800 meters, May 14, 1917, by Conzatti, Reko, and Makrinius (no. 3286).

The only other Mexican species of the genus is *Brosimum alicastrum* Swartz. It is distinguished from *B. conzattii* by the much larger, relatively broad, acuminate leaves and much larger flower heads.

Coussapoa rekoi Standl., sp. nov.

Branchlets thick, grayish, rugose, minutely puberulent, sparsely aculeolate; stipules 3.5 to 4.2 cm. long, minutely ferrugino-puberulent, copiously aculeolate with short, stout, divaricate or antrorse prickles; petioles very stout, about 1.5 cm. long, obscurely puberulent or glabrate; leaf blades broadly ovate-oval or rounded-ovate, 11 to 19 cm. long, 7.5 to 13 cm. wide, rounded and somewhat unequal at the base, rounded or very obtuse at the apex and abruptly acuminate-apiculate, coriaceous, grayish green above, sublustrous, minutely puberulent or glabrate, the costa and lateral veins prominent, slightly paler beneath, densely and very minutely grayish-puberulent or tomentulose, the costa and lateral veins very prominent, sparsely armed with short stout prickles, the lateral veins 6 to 9 on each side, straight, the transverse veins prominulous, the margin plane or subrevolute; pistillate and staminate heads solitary, the peduncles stout, 0.6 to 1.4 cm. long, minutely puberulent, the heads globose, 1 to 1.4 cm. in diameter; bracts of the staminate heads broad, cucullate, puberulent, the calyx parted almost to the base, the lobes cucullate-obovate, puberulent; stamens 2; bracts of the pistillate heads concrete, the exposed portion muricate and minutely puberulent.

Type in the U. S. National Herbarium, no. 842612, collected at Cafetal Concordia (Cerro Espino), Oaxaca, Mexico, November 15, 1917, by B. P. Reko (no. 3590).

Distinguished from all other species of the genus by the prickles of the branchlets, stipules, and leaves. The vernacular names are "carnero" and "chirimoya." Doctor Reko states that the fruit is edible and that the leaves are sometimes half a meter long.

Ficus involuta (Liebm.) Miquel, Ann. Mus. Bot. Lugd. Bat. 3: 298. 1867.

Urostigma involutum Liebm. Dansk. Vid. Selsk. Skrivt. V. 2: 320. 1851.

Urostigma bonplandianum Liebm. Dansk. Vid. Selsk. Skrivt. 2: 323. 1851.

Ficus bonplandiana Miquel, Ann. Mus. Bot. Lugd. Bat. 3: 298. 1867.

In a recent paper dealing with the Mexican and Central American species of *Ficus*,[1] the writer listed[2] this species as *Ficus bonplandiana*, but suggested

[1] Contr. U. S. Nat. Herb. 20: 1–35. 1917. [2] Op. cit. 30.

that the name *Urostigma involutum* probably referred to the same plant. Through the kindness of Dr. C. H. Ostenfeld, a leaf of the type of *U. involutum*, in the herbarium at Copenhagen, has now been examined, and this shows conclusively that the two specific names are synonymous. The correct name for the plant, then, is *Ficus involuta* (Liebm.) Miquel.

Struthanthus densiflorus (Benth.) Standl.
Loranthus densiflorus Benth. Pl. Hartw. 62. 1840.

Struthanthus diversifolius (Benth.) Standl.
Loranthus diversifolius Benth. Pl. Hartw. 63. 1840.

Struthanthus grahami (Benth.) Standl.
Loranthus grahami Benth. Pl. Hartw. 62. 1840.

Struthanthus haenkeanus (Presl) Standl.
Spirostylis haenkeanus Presl; Schult. Syst. Veg. 7: 163. 1829.
Loranthus spirostylis DC. Prodr. 4: 315. 1830.

Struthanthus hartwegi (Benth.) Standl.
Loranthus hartwegi Benth. Pl. Hartw. 62. 1840.

Struthanthus inconspicuus (Benth.) Standl.
Loranthus inconspicuus Benth. Bot. Voy. Sulph. 102. 1844.

Struthanthus inornus (Robins. & Greenm.) Standl.
Loranthus inornus Robins. & Greenm. Amer. Journ. Sci. 50: 163. 1895.

Phrygilanthus sonorae (S. Wats.) Standl.
Loranthus sonorae S. Wats. Proc. Amer. Acad. 24: 73. 1889.

Ximenia pubescens Standl., sp. nov.

Branches slender, grayish, armed with stout straight spines 5 to 8 mm. long, the branchlets densely pilose with short fulvous hairs, the pubescence persistent in age; petioles stout, 3 to 5 mm. long, densely puberulent; leaf blades orbicular or broadly oval, 2.2 to 4 cm. long, 2 to 3.5 cm. wide, rounded at the base, rounded at the apex and often obscurely emarginate, coriaceous, densely puberulent; pedicels and calyx densely puberulent; calyx lobes minute, broadly ovate, obtuse or acutish; petals 4.5 to 5 mm. long, acute or acutish, puberulent outside, densely barbate within from the middle to the base; anthers about 1.5 mm. long.

Type in the U. S. National Herbarium, no. 888478, collected between Mixtepec and Colotepec, Oaxaca, Mexico, altitude 75 to 240 meters, March 6, 1895, by E. W. Nelson (no. 2448).

Two other species of *Ximenia* are known from Mexico, *X. americana* L. and *X. parviflora* Benth., both of which are glabrous plants. *X. pubescens* differs from both in its broad leaves, but the small corolla indicates a relationship with the latter species.

A specimen collected in the foothills of the Sierra Madre, Sinaloa, by J. N. Rose, July 13 to 20, 1897, also has pubescent leaves, but the blades are oblong or elliptic-oblong, and very small. It is accompanied by fruit, but without flowers its position is doubtful. Probably it represents an undescribed species, but it may be only a variant of *X. pubescens*.

Platanus chiapensis Standl., sp. nov.

Tree, 15 meters high, the branchlets grayish brown, with a feltlike brownish tomentum at first but soon glabrate; petioles stout, 2 to 6 cm. long, tomentose at first; leaf blades very broadly ovate or ovate-orbicular, 8.5 to 23.5 cm. long, 5.5 to 19 cm. wide, rounded or subtruncate at the base and usually abruptly short-decurrent, very acute to long-acuminate at the apex, with a few coarse mucronate teeth near or above the middle or sometimes shallowly trilobate,

with entire acute lobes, brownish-tomentose at first on the upper surface but soon glabrate, beneath densely covered with a close, grayish or yellowish tomentum; peduncle and rachis together 24 cm. long, slender, glabrate; heads 3 or 4, 2.5 to 3 cm. in diameter, borne on stout stalks 1 to 2 cm. long; achene 5 to 5.5 mm. long, glabrous below, densely pilose above, about equaled by the basal hairs, the persistent style 3 to 4 mm. long.

Type in the U. S. National Herbarium, no. 470790, collected at Zincantán, Chiapas, Mexico, May 16, 1904, by E. A. Goldman (no. 993). Immature specimens, apparently referable here, were obtained at Teopisca, Chiapas, by G. N. Collins and C. B. Doyle (no. 128).

Most closely related to *P. lindeniana* Mart. & Gal., but easily distinguished by the stalked pistillate heads.

Platanus oaxacana Standl., sp. nov.

Young branches grayish or dark brown, glabrate; petioles stout, 1 to 3.5 cm. long, tomentose; leaf blades 6.5 to 15 cm. long, 7.5 to 18.5 cm. wide, truncate or subcordate at the base, obscurely or not at all decurrent, usually shallowly trilobate, the lobes long-acuminate, irregularly dentate with coarse acuminate teeth, green and glabrate on the upper surface, covered beneath with a sparse close grayish tomentum; heads 3 or 4, sessile, 3 to 3.8 cm. in diameter, the peduncle stout, 4 to 5 cm. long; achene 6 to 7 mm. long, tomentose at the apex at first but soon glabrate, the persistent style 3 to 4 mm. long.

Type in the U. S. National Herbarium, no. 888488, collected at San Miguel Alborrados, Oaxaca, Mexico, altitude 1,950 meters, July 2, 1894, by E. W. Nelson (no. 540).

The present plant is evidently related to *P. lindeniana* Mart. & Gal., of which it may be only a form, but in that species the leaves are narrower, rounded, and decurrent at the base, with a loose whitish tomentum, and the long, narrow lobes are commonly entire.

Prunus prionophylla Standl., sp. nov.

Plant glabrous throughout, the branches dark brown or blackish, roughened with numerous lenticels; petioles stout, about 1 cm. long; leaf blades lance-oblong or narrowly elliptic-oblong, 9 to 11 cm. long, 3 to 3.5 cm wide, rounded or obtuse at the base, acute at the apex, the venation impressed, pale beneath, the costa very stout and salient, the lateral veins plane or prominulous, the margin coarsely serrate almost to the apex, the lower surface usually with 2 glands at the base adjacent to the costa; racemes axillary, subsessile, solitary, naked, 4 to 5 cm. long, densely many-flowered, the pedicels very stout, 3 to 4 mm. long; calyx tube 3 mm. long, glabrous within, soon deciduous, the lobes oblong-oval; petals rounded, about 3 mm. long and broad, glabrous, white; ovary ovoid, tapering to the style; stigma about 1 mm. broad.

Type in the U. S. National Herbarium, no. 470171, collected along brooks on Ixtaccihuatl, Mexico, altitude 2,100 to 2,400 meters, in 1903, by C. A. Purpus (no. 249).

A species of the subgenus *Laurocerasus*, but not closely related to any known from Mexico. The coarse teeth of the leaves suggest the very different *Prunus ilicifolia* (Nutt.) Walp., of California and Baja California.

Caesalpinia acapulcensis Standl., sp. nov.

Unarmed shrub or small tree; branches terete, brown, with large pale lenticels, puberulent when young and furnished with short-stipitate glands; petioles 2.5 to 3 cm. long, sometimes with scattered stipitate glands; pinnae 2 or 3 pairs; leaflets 1 or 2 pairs, opposite, short-petiolulate, obliquely ovate, oval-oblong, or oval, 2 to 4 cm. long, 1.5 to 2.7 cm. wide, very oblique at the base,

rounded at the apex, chartaceous, glabrous, green above, pale beneath, the venation prominent or prominulous; racemes 5 to 14 cm. long, paniculate, few or many-flowered, the pedicels 5 to 11 mm. long, minutely pilose and densely covered with stipitate glands; calyx densely glandular, the tube about 4 mm. broad, the lobes oval, entire; petals 8 to 10 mm. long, yellow, with numerous sessile or stipitate glands outside on the lower part; stamens longer than the petals, the filaments white-villous below; fruit 6.5 to 7.5 cm. long, about 1.7 cm. wide, subsessile, minutely pilose, eglandular, elastically bivalvate.

Type in the U. S. National Herbarium, no. 266490, collected in the vicinity of Acapulco, Guerrero, Mexico, in 1894 or 1895, by Edward Palmer (no. 505).

Related to *C. mexicana* A. Gray as closely as to any of the described Mexican species. In that, however, the inflorescence is without glands and the leaflets are smaller and more numerous.

Caesalpinia caladenia Standl., sp. nov.

Unarmed shrub or small tree, the branches terete, striate, brown or reddish brown, with numerous pale lenticels, short-pilose and glandular when young; petioles 1.5 to 3 cm. long, short-pilose or glabrate and sometimes glandular; pinnae 2 to 4 pairs; leaflets 3 or 4 (rarely 2) pairs, short-petiolulate, oval, elliptic-oblong, or oblong-obovate, 1 to 2.6 cm. long, 0.5 to 1.7 cm. wide, rounded to subacute at the base and often oblique, rounded at the apex, glabrous, slightly paler beneath, chartaceous, with prominulous venation; racemes many-flowered, 6.5 to 17 cm. long, the pedicels 6 to 16 mm. long, jointed below the calyx, densely short-pilose and furnished with numerous reddish stipitate glands; calyx tube 5 to 7 mm. broad, pilose and stipitate-glandular, the lobes 6.5 to 8.5 mm. long, oblong, rounded at the apex, velvety-pilose, glandular on the margins; petals 10 to 12 mm. long, glandular outside on the lower portion; stamens equaling or slightly exceeding the petals, the filaments densely white-villous except near the apex; fruit 4.5 to 6.5 cm. long, 1.2 to 1.6 cm. wide, subsessile, straight, densely velutinous and covered with sessile or stipitate glands, elastically bivalvate.

Type in the U. S. National Herbarium, no. 635473, collected on hills about 5 miles below Minas Nuevas, Sonora, Mexico, March 12, 1910, by J. N. Rose, P. C. Standley, and P. G. Russell (no. 12660).

Here, also, may be referred the following collections:

COLIMA: Manzanillo, *Palmer* 1397. Colima, 1891, *Palmer* F.

The Colima specimens have somewhat larger leaflets than the type. *Caesalpinia caladenia* is related to *C. acapulcensis*, described above, but differs in the glandular fruit, larger flowers, and smaller, narrower, more numerous leaflets.

Caesalpinia sclerocarpa Standl., sp. nov.

Unarmed tree, the branches slender, brown or grayish, with numerous pale lenticels, glabrous; leaves glabrous, usually odd-pinnate, the petioles 1 to 1.6 cm. long, the pinnae 4 or 5, the leaflets 3 or 4 pairs, opposite, short-petiolulate, elliptic to oblong, 10 to 18 mm. long, 5 to 9 mm. wide, rounded or obtuse at the base, usually slightly oblique, broadly rounded at the apex, chartaceous, the costa prominent beneath but the other venation inconspicuous; racemes axillary or paniculate, 4 to 7 cm. long, few or many-flowered, dense, the rachis angulate, fulvous-puberulent, the pedicels stout, 2 to 3 mm. long; calyx densely fulvous-puberulent, the tube 3 to 4 mm. broad, the lobes very unequal, entire, the outer one larger than the others; petals about 7 mm. long; stamens equaling the petals, the filaments villous below; fruit 3.5 to 8 cm. long, 1.4 to 1.8 cm. wide, rounded at both ends, short-rostrate at the apex, blackish, glabrous, borne on a stout stipe 5 mm. long, indehiscent, the valves very thick (about 3 mm.) and hard.

Type in the U. S. National Herbarium, no. 229315, collected between San Gerónimo and La Venta, Oaxaca, Mexico, altitude 60 meters, July 13, 1895, by E. W. Nelson (no. 2784).

The following additional collections belong here:

SINALOA: Between Rosario and Acaponeta, *Rose* 1870. Guadalupe, *Rose, Standley & Russell* 14748. Near Colomas, *Rose* 3241.

JALISCO: Jayamita, *Jones* 164.

Closely related, apparently, to *C. glabrata* H. B. K., a plant of Peru and Colombia, with glabrous calyx and smaller leaflets. *C. vesicaria* L., known in Mexico only from Yucatán, is a similar plant, but it has very large, coriaceous leaflets of different shape.

Cassia chiapensis Standl., sp. nov.

Erect shrub, the branches stout, terete, very densely pilose with grayish or fulvous hairs; stipules lance-linear, 11 to 15 mm. long, attenuate, deciduous, pilose outside; petioles 1.5 to 3.5 cm. long, the rachis 4 to 7 cm. long, densely pilose, a slender clavate gland usually present between each pair of leaflets; leaflets 3 to 6 pairs, oval, oblong-oval, or ovate-oval, 2 to 4 cm. long, 1.2 to 2.5 cm. long, petiolulate, rounded and subequal at the base, rounded at the apex, chartaceous, green on the upper surface, glabrous, the venation rather conspicuous, densely pilose beneath with slender whitish subappressed hairs; flowers racemose, the racemes many-flowered, dense, 4.5 to 10 cm. long, borne on a stout pilose peduncle 4 to 8 cm. long, the pedicels 6 to 13 mm. long, the bracts short, lance-linear, caducous; outer sepals oval, 3.5 mm. long, sparsely short-pilose, green, the inner ones rounded-obovate, 5 mm. long, yellowish, ciliate; petals 5 to 7 mm. long, spatulate-obovate, short-clawed, glabrous, pale yellow, conspicuously veined; stamens 10, 3 of them abortive, 3 of them with stout anthers 3.5 mm. long, the other 4 with anthers 2.5 mm. long, the anthers erostrate, opening by apical pores; ovary densely pilose; fruit about 5 cm. long and 7 mm. wide, very acute and stipitate at the base, obtuse or acutish and short-rostrate at the apex, glabrous at maturity, the valves thin, flat, the seeds transverse-oblique.

Type in the U. S. National Herbarium, no. 470740, collected at Teopisca, Chiapas, Mexico, May 7, 1904, by E. A. Goldman (no. 939). Also collected between San Cristóbal and Teopisca, Chiapas, altitude 2,000 to 2,550 meters, December 4, 1895, by E. W. Nelson (no. 3481a).

This plant belongs to Bentham's section *Chamaesenna*, and apparently to the series *Pachycarpae*, but it is not closely related to any of the species referred there by that author. The small flowers are the most prominent character.

Cassia tonduzii Standl., sp. nov.

Tree or large shrub, the branches slender, striate-angulate, fulvous-puberulent; stipules subulate, deciduous; petioles 1.5 to 2 cm. long, the rachis 5 to 10 cm. long, sparsely puberulent, usually with a long slender clavate gland between each pair of leaflets; leaflets 4 to 6 pairs, short-petiolulate, elliptic to narrowly lance-elliptic, 2 to 9 cm. long, 1 to 2.8 cm. wide, rounded to subacute at the base, acuminate or abruptly acuminate at the apex, rarely only acute, membranaceous, green on the upper surface, sublustrous, glabrous or very minutely puberulent, the venation mostly impressed, scarcely paler beneath, thinly strigillose with slender, grayish or yellowish hairs, the costa and lateral nerves slender but very prominent, the margin plane or revolute; flowers in 2 or few-flowered axillary racemes borne on slender peduncles, very numerous, the pedicels long and slender, puberulent; sepals orbicular, the outer

ones 5 mm. long, sparsely puberulent, the inner ones 8 to 10 mm. long, glabrous; petals very unequal, 2 of them about 2.5 cm. long and 2 cm. wide, the others lanceolate or ovate, 1 to 1.5 cm. long and 2 to 4 mm. wide, slender-clawed, all more or less puberulent; stamens 10, 3 of them abortive, the 3 largest ones with curved anthers nearly 1 cm. long terminating in a slender tube 5 to 6 mm. long, the other 4 with erostrate anthers 4 mm. long; ovary densely appressed-pilose with fulvous hairs; fruit (immature) 16 to 18 cm. long, 5 to 6 mm. wide, glabrate, long-stipitate, rounded and rostrate at the apex, the valves flat, thin.

Type in the U. S. National Herbarium, no. 471718, collected along the Río Tiliri, Costa Rica, November 23, 1892, by A. Tonduz (no. 7213).

The following additional specimens belong here:

COSTA RICA: Río Tiliri, December, 1890, *Tonduz* 3197. Alajuelita, alt. 1,100 meters, December, 1889, *Tonduz* 1484.

CHIAPAS: Between Tuxtla and Cristóbal, alt. 690 to 1,650 meters, 1895, *Nelson* 3127.

This species belongs to Bentham's section *Chamaesenna*, series *Rostratae*. It seems to be related to *Cassia robiniaefolia* Benth., but in that the leaflets are more numerous and obtuse or acutish, with inconspicuous venation. One of the Costa Rican collections was determined by Micheli as *C. laevigata* Willd., a species not closely related to the present one.

Indigofera sphinctosperma Standl., sp. nov.

Shrub, the branches very slender, densely white-strigose; stipules very short, subulate; leaves petiolate, the rachis very slender, the leaflets usually 11 to 15, oval or rounded-oval, the largest 13 mm. long and 8 mm. wide, rounded or very obtuse at the base, broadly rounded at the apex and mucronulate, densely or sparsely gray-strigose on both surfaces, conspicuously petiolulate; racemes slender, 5 to 15 cm. long, the flowers short-pedicellate, at first dense but distant in anthesis, the bracts filiform-subulate; calyx densely strigose, the lobes triangular, equaling or slightly longer than the tube; standard petal about 3.5 mm. long, densely strigose; fruit 3 to 4 mm. long, tetragonous, white-strigillose, sessile, subtruncate at each end, slightly constricted; seed 1.2 to 2.5 mm. long, cylindric, subtruncate at each end, olivaceous, usually with 2 shallow transverse constrictions.

Type in the U. S. National Herbarium, no. 840446, collected in the Barranca de Santa María, Zacuapan, Veracruz, Mexico, November, 1906, by C. A. Purpus (no. 2332).

The following collections also belong here:

VERACRUZ: Baños de Carrizal, *Purpus* 6077. Barranca de Santa María, *Purpus* 3641.

Several other species of *Indigofera* found in Mexico have short, one or few-seeded pods, but in all of them the seeds are shorter and of different shape, and the fruit is either globose or ovoid, with an acute or rounded apex.

Phyllocarpus septentrionalis Donn. Smith, Bot. Gaz. 55: 433. 1913.

This recently described plant is a most interesting one, because of the fact that the only other known representative of the genus is a native of Brazil. The type of *P. septentrionalis* was collected near Gualán, Guatemala. Recently there have been received at the National Herbarium complete specimens collected one mile above El Progreso, Guatemala, at an altitude of 510 meters, by F. W. Popenoe (no. 759). Mr. Popenoe's notes regarding this collection are as follows: "Large tree, about 15 meters high, in sandy soil along the banks of streams. Flowers light scarlet. The tree blooms when nearly devoid of leaves, and is a mass of flowers." The vernacular name is given as "flor de mico."

Cracca brandegei Standl., sp. nov.

Plants slender, erect or ascending, herbaceous or suffrutescent, much branched from the base, the stems angulate, densely hirtellous with short spreading whitish hairs; stipules subulate, 3 mm. long; petioles 1 to 2 cm. long, the rachis 2 to 5 cm. long, hirtellous; leaflets 9 to 19, distant, linear or oblong-linear, 0.6 to 4.5 cm. long, 1.5 to 6 mm. wide, acute at the base, acute or obtuse at the apex, thin, copiously pilose on the upper surface with very short whitish subappressed hairs, thinly sericeous or short-pilose beneath, the lateral nerves numerous, parallel, ascending at a very acute angle; racemes leaf-opposed, 10 to 23 cm. long (including the peduncle), slender, the flowers remote, the bracts short, subulate; pedicels slender, 2 to 4 mm. long, hirtellous; calyx 2.5 to 3.5 mm. long, hirtellous, the lobes triangular, attenuate, as long as the tube; corolla purple, the standard 7 to 8 mm. long, finely sericeous outside; fruit 3 to 4 cm. long, 2.5 to 3 mm. wide, very flat, minutely pilose with spreading or subappressed hairs; seeds 2.5 to 3 mm. long, mottled with black and olivaceous brown, with a minute strophiole.

Type in the U. S. National Herbarium, no. 572116, collected at Altata, Sinaloa, Mexico, September 2, 1904, by T. S. Brandegee. Also collected in the vicinity of Durango in 1896 by Edward Palmer (no. 375).

Closely related to *C. purpurea* L. (*Tephrosia tenella* A. Gray), but in that the pubescence is closely appressed. *Cracca vicioides* (Schlecht.) Kuntze also is a near relative, but that is a bright green, nearly glabrous plant, with brown pubescence on the stems, and with leaflets glabrous on the upper surface.

Cracca tepicana Standl., sp. nov.

Plants apparently decumbent, herbaceous or suffrutescent, the stems slender, flexuous, hispidulous when young, glabrate in age; stipules small, subulate; leaves sessile or petiolate, the rachis 3.5 to 10 cm. long; leaflets 5 to 11, oblong, elliptic-oblong, or oval-oblong, 2 to 4.8 cm. long, 1 to 2 cm. wide, short-petiolulate, rounded at the base, rounded or very obtuse at the apex, chartaceus, green on the upper surface, strigillose or glabrate, the venation prominulous and reticulate, thinly strigose beneath, the venation prominent, the margin hispid-ciliate; racemes 10 to 22 cm. long (including the long peduncle), the flowers in distant or approximate fascicles, the slender pedicels 4 to 8 mm. long, strigose, the bracts filiform-subulate, 8 mm. long or shorter; calyx 5 mm. long, strigillose, the lobes triangular-acuminate, about as long as the tube; standard petal 11 to 13 mm. long, and nearly as wide, brownish-sericeous outside; ovary densely sericeous.

Type in the U. S. National Herbarium, no. 305316, collected at Tepic, Mexico, in 1892, by Edward Palmer.

A very distinct plant, related as closely to *C. langlassei* (Micheli) Rose, as to any of the Mexican species. The latter is distinguished by its long, copious pubescence and acute leaflets.

Andira galeotttiana Standl., sp. nov.

Branches terete, reddish brown or grayish, rimose, the young branchlets stout, angulate, fulvous or ferruginous-tomentose; petioles stout, 4.5 to 6 cm. long, the rachis 5 to 14.5 cm. long, brown-tomentose; leaflets 5 to 13, all opposite or the lower ones alternate, the petiolules very stout, about 6 mm. long, the blades oblong or oval-oblong, rarely obovate-oblong, 3 to 13 cm. long, 2.8 to 5.5 cm. wide, rounded or subtruncate at the base, rounded at the apex and apiculate, subcoriaceous, green on the upper surface, tomentulose when young, becoming glabrate, the venation impressed, beneath densely tomentose or sub-

sericeous with brown lustrous hairs, the margin plane or revolute; racemes densely flowered, pedunculate, 6 to 8.5 cm. long, forming a panicle 20 to 30 cm. long, the branches ferruginous-tomentose, the flowers solitary or fasciculate, short-pedicellate; calyx 8 mm. long, densely tomentose, the lobes deltoid, obtuse or acutish, about 2 mm. long; petals glabrous, long-clawed; standard 17 mm. long, the blade suborbicular, 11 mm. wide, deeply retuse at the apex, subtruncate at the base, the claw 5 to 6 mm. long; blades of the wings oblong, 9 mm. long, 3 mm. wide, rounded at the apex, produced at the base into a rounded auricle, the claw 6 mm. long; keel petals similar to the wings in size and form; stamens diadelphous, the filaments 10 to 14 mm. long; ovary long-stipitate, glabrous, 1 or 2-ovulate.

Type in the U. S. National Herbarium, no. 888479, collected at Catemaco, Veracruz, Mexico, altitude 300 meters, April 26, 1894, by E. W. Nelson (no. 424). Also collected at Lalana (Chinantla), Puebla, July, 1844, by H. Galeotti (no. 3464).

The only other species of *Andira* found in Mexico is *A. jamaicensis* (W. Wright) Urban, a widely distributed plant with glabrous, acute or acuminate leaflets, much smaller flowers, and pubescent ovary.

Galeotti gives the vernacular name as "macayo."

Picramnia pistaciaefolia Blake & Standl., sp. nov.

Branches very slender, flexuous, brownish gray, puberulent when young; leaves 8 to 18 cm. long, the rachis slender, puberulent; leaflets 19 to 23, short-petiolulate, the upper ones opposite, the lower ones smaller and alternate, the lowest pair borne at or near the base of the rachis, the blades ovate-rhombic or the lowest rhombic-oval, 1 to 3.5 cm. long, 0.6 to 1.2 cm. wide, very oblique at the base and obtuse to acuminate, subabruptly obtuse-acuminate at the apex, thin, minutely puberulent when young, glabrate in age; panicles slender, 15 to 20 cm. long, the staminate ones spiciform, the pistillate racemiform, the rachis puberulent; sepals 3, about 1 mm. long, ovate or ovate-oval, obtuse, puberulent outside; petals 3, ligulate, slightly longer than the sepals; stamens 3, twice as long as the petals; fruit (immature) obovoid, about 1 cm. long and 6 mm. in diameter.

Type in the U. S. National Herbarium, no. 842534, collected at Cafetal San Rafael (Cerro Espino), Oaxaca, Mexico, altitude 800 meters, October 28, 1917, by B. P. Reko (no. 3452). The type material consists of a fruiting branch. Specimens in flower were obtained on Cerro de Huatulco, Oaxaca, altitude 900 meters, August 28, 1917, by Doctor Reko (no. 3360).

In the key to the species of *Picramnia* in the North American Flora[1] this plant would run at once to *P. antidesma* Swartz, a species widely different from the present one in the size, form, and texture of the leaflets, and in the size of the flowers. *Picramnia pistaciaefolia* seems to be different also from any of the Mexican species described by Tulasne, which are only mentioned as doubtful in the North American Flora.

Doctor Reko states that the vernacular names are "ramón" and "lentisco."

Rhus barclayi (Hemsl.) Standl.

Rhus terebinthifolia barclayi Hemsl. Biol. Centr. Amer. Bot. 1: 219. 1880.

This is distinguished sufficiently from *R. terebinthifolia* Schlecht. by the long petiolules of the lateral leaflets. The pubescence on the lower surface of the leaflets, too, is much less dense, and consists of long, straight, stiff, rather slender hairs. In *R. terebinthifolia* the lateral leaflets are nearly sessile, and

[1] 25: 235. 1911.

densely velvety-pilose or almost tomentose beneath. The following specimens belong here:

TEPIC: Tepic, 1892, *Palmer* 1907. Between Colomos and Arroyo Juan Sánchez, 1897, *Nelson* 4166.

The type was collected at Acapulco.

Rhus jaliscana Standl., sp. nov.

Shrub, 3 to 4.5 meters high, the branchlets reddish brown, rough-lenticellate, puberulent; leaves pinnate, 9 to 15-foliolate, the petioles slender, 1.5 to 2.5 cm. long, puberulent, the pairs of leaflets 6 to 14 mm. apart, the petiolules 1 to 3 mm. long, slender, the blades elliptic or elliptic-oblong, sometimes ovate, 1.4 to 2.6 cm. long, 0.6 to 1.5 cm. wide, rounded to acutish at the base and usually unequal, commonly obtuse at the apex but sometimes acute or subacuminate, mucronulate, chartaceous, entire, green above, dull, sparsely short-pilose with subappressed hairs or glabrate, the venation more or less impressed, only slightly paler beneath, very sparsely pilose with minute, mostly appressed hairs or subbarbate in the axils of the veins, the lateral veins 4 to 6 on each side, the margin plane or subrevolute; panicles usually much longer than the leaves, the branches very slender, spiciform, remotely flowered, the flowers sessile; bracts rounded-ovate, obtuse, scarious; sepals rounded-ovate, obtuse, glabrous; petals obtuse, about half longer than the sepals; fruit 5 mm. long, 6 to 7 mm. wide, compressed, sparsely setose-pilose.

Type in the U. S. National Herbarium, no. 19926, collected in moist places in the barranca near Guadalajara, Jalisco, Mexico, November 3, 1888, by C. G. Pringle (no. 1774).

ADDITIONAL SPECIMENS EXAMINED:

JALISCO: Between Bolaños and Guadalajara, 1897, *Rose* 3093. Barranca near Guadalajara, 1907, *Safford* 1458a; in 1902, *Pringle* 9712.

Pringle's collections were distributed as *Rhus terebinthifolia* Schlecht., a species with larger, less numerous, subsessile or short-petiolulate leaflets, these usually more acute and more densely pubescent. *R. barclayi* is closely related to *R. jaliscana*, but differs in its large, less numerous, acuminate leaflets.

Bernoullia flammea Oliver in Hook. Icon. Pl. 12: 62. *pl. 1169, 1170.* 1873.

This remarkable tree, of the family Bombacaceae, was based by Oliver upon specimens and a drawing obtained by Dr. G. Bernoulli in the "Costa Grande of Guatemala, from about 500 to 2,000 ft."[1] So far as the writer knows, the species has been known heretofore only from the original collection. Recently, however, Dr. Blas P. Reko forwarded to the National Herbarium specimens, accompanied by a water-color sketch, which he had obtained at the Cafetal Nueva Esperanza, Oaxaca, Mexico, at an altitude of about 800 meters. Doctor Reko's rediscovery of this little known plant is of unusual interest, since it indicates a noteworthy extension of range for the species. Moreover, this new material shows that the diagnosis of the genus must be corrected in one important respect. The plant was described originally as having digitately trifoliolate leaves, but Doctor Reko states, and the specimens show, that the number of leaflets, though variable, is usually five or six.

Doctor Reko's notes give the following additional information about the plant: "The tree grows in a very limited area on the Cerro Espino, at an altitude of about 800 meters, and reaches a height of 30 to 40 meters. In appearance it reminds one of the ceiba tree, which it resembles also in the soft, spongy

[1] In Engler and Prantl's Natürlichen Pflanzenfamilien (3[6]: 65. *fig. 34.* 1895) Schumann gives the range of the plant as Costa Rica, but presumably this is due to a slip of the pen.

texture of its wood, whence it has received its popular name, 'palo de calabaza.' The deciduous leaves are alternate. The flowers, which appear in the dry season, before the new leaves, are of a vermilion color in all their parts, likewise the branches of the terminal inflorescence. The pollen is smooth on its surface. The fruit resembles in shape that of the genus *Cheirostemon*, although much larger (20 cm. long). It is a 5-valved woody capsule with smooth interior, with grooves and numerous dents for the reception of the ascending seeds."

Marcgravia guatemalensis Standl., sp. nov.

Branches dark brown, glabrous, minutely papillose; petioles very stout, about 2 mm. long; leaf blades narrowly lance-oblong, 9 to 14.5 cm. long, 2 to 4 cm. wide, rounded or very obtuse at the base, somewhat oblique, long-acuminate at the apex, chartaceous, glabrous, minutely papillose, green above, the costa impressed, the lateral veins mostly obsolete, brownish beneath, the costa stout, salient, the lateral veins very slender, usually prominulous, about 13 on each side; racemes short-pedunculate, umbelliform, about 16-flowered, the pedicels about 2.5 cm. long, stout, divaricate, puberulent, the flower inserted obliquely, the rachis prolonged about 8 mm. above the fertile flowers; sepals 1 to 1.5 mm. long, much broader than long, very broadly rounded at the apex; corolla ovoid, 8 mm. long, obtuse, glabrous; stamens about 12; nectaries about 4, tubular-cucullate, straight, clavate above, puberulent, the stipe 1 to 1.2 cm. long, the hood 2 to 2.3 cm. long, 3.5 mm. thick above, the orfice about 3 mm. broad.

Type in the U. S. National Herbarium, no. 408015, collected near the Finca Sepacuité, Alta Verapaz, Guatemala, March 28, 1902, by O. F. Cook and R. F. Griggs (no. 230). Additional material of the same collection, consisting of a sterile branch, is mounted on sheet no. 408014.

This plant is most closely related to *M. eichleriana* Wittmack, of Brazil, but is distinguished by the subsessile leaves and narrow nectaries.

Tonduzia parvifolia Pittier, Contr. U. S. Nat. Herb. **12**: 103. 1908.

Heretofore this species has been known only from Costa Rica. Specimens collected at Cafetal Montecristo, Oaxaca, by Dr. B. P. Reko (no. 3382) seem to belong here rather than to *T. stenophylla* (Donn. Smith) Pittier, a Guatemalan species. Doctor Reko gives the vernacular name as "chamizillo."

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[Synonyms in italic. Page numbers of principal entries in heavy-face type.]